HP ProLiant ML350e Gen8 v2 Server Maintenance and Service Guide

Abstract

This document is for an experienced service technician. It is helpful if you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels and are familiar with weight and stability precautions for rack installations.

Part Number: 742226-002
January 2014
Edition: 2

© Copyright 2013, 2014 Hewlett-Packard Development Company, L.P.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

Microsoft® and Windows® are U.S. registered trademarks of Microsoft Corporation.

Intel® Xeon® is a registered trademark of Intel Corporation in the U.S. and other countries.

Contents

Customer self repair 5
Parts only warranty service 5
Illustrated parts catalog 15
Mechanical components 15
System components 18
Removal and replacement procedures 23
Required tools 23
Safety considerations 23
Preventing electrostatic discharge 23
Symbols on equipment 23
Server warnings and cautions 24
Preparation procedures 24
Power down the server 25
Power up the server 25
Unlock the front bezel 26
Remove the front bezel 26
Access panel 26
PCI air baffle 27
System air baffle 28
Front USB module 29
Front panel LED/buttons module 30
Fan modules and fan blank 31
Hot-plug drive blank 32
Storage drive 33
Hot-plug drive 33
Non-hot-plug drive 34
Integrated power supply 35
Power supply modules 36
Optical drive 37
Cache module for onboard controller (B120i) 38
FBWC capacitor pack 39
Full-length expansion board 41
DIMMs 43
Heatsink 44
Processor 46
System board 50
System battery 57
HP Trusted Platform Module 58
Troubleshooting 59
Troubleshooting resources 59
Diagnostic tools 60
HP ROM-Based Setup Utility 60
HP Insight Diagnostics 60
HP Insight Diagnostics survey functionality 60

Integrated Management Log 61
USB support 61
Automatic Server Recovery 61
Component identification 62
Front panel components 62
Front panel LEDs and buttons 64
Rear panel components 65
Rear panel LEDs 66
System board components 66
System maintenance switch 67
System board LEDs 68
NMI functionality 68
DIMM slot locations 69
Smart Array SAS RAID controller card components 69
SAS and SATA device numbers 70
SAS and SATA drive LED combinations 72
FBWC module LED definitions 73
P222 and P430 modules 73
B120i module 74
Hot-plug drive LED definitions 75
Fan locations 76
Redundant power supply connectors 76
Cabling 78
Storage cabling 78
Non-hot-plug, four-bay LFF drive cabling 78
Hot-plug, four-bay LFF drive cabling 79
Hot-plug, four-bay + four-bay LFF drive cabling 79
Hot-plug, eight-bay SFF drive cabling 80
Hot-plug, eight-bay + eight-bay SFF drive cabling 81
Power cabling 82
Integrated power cabling 82
RPS power cabling 82
Optical drive cabling 83
Capacitor pack cabling 83
Specifications 86
Environmental specifications 86
Server specifications 86
Power supply specifications 86
Hot-plug power supply calculations 88
Acronyms and abbreviations 89
Documentation feedback 91
Index 92

Customer self repair

HP products are designed with many Customer Self Repair (CSR) parts to minimize repair time and allow for greater flexibility in performing defective parts replacement. If during the diagnosis period HP (or HP service providers or service partners) identifies that the repair can be accomplished by the use of a CSR part, HP will ship that part directly to you for replacement. There are two categories of CSR parts:

- **Mandatory**—Parts for which customer self repair is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.
- **Optional**—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that HP replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.

NOTE: Some HP parts are not designed for customer self repair. In order to satisfy the customer warranty, HP requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

Based on availability and where geography permits, CSR parts will be shipped for next business day delivery. Same day or four-hour delivery may be offered at an additional charge where geography permits. If assistance is required, you can call the HP Technical Support Center and a technician will help you over the telephone. HP specifies in the materials shipped with a replacement CSR part whether a defective part must be returned to HP. In cases where it is required to return the defective part to HP, you must ship the defective part back to HP within a defined period of time, normally five (5) business days. The defective part must be returned with the associated documentation in the provided shipping material. Failure to return the defective part may result in HP billing you for the replacement. With a customer self repair, HP will pay all shipping and part return costs and determine the courier/carrier to be used.

For more information about HP's Customer Self Repair program, contact your local service provider. For the North American program, refer to the HP website (http://www.hp.com/go/selfrepair).

Parts only warranty service

Your HP Limited Warranty may include a parts only warranty service. Under the terms of parts only warranty service, HP will provide replacement parts free of charge.

For parts only warranty service, CSR part replacement is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.

Réparation par le client (CSR)

Les produits HP comportent de nombreuses pièces CSR (Customer Self Repair = réparation par le client) afin de minimiser les délais de réparation et faciliter le remplacement des pièces défectueuses. Si pendant la période de diagnostic, HP (ou ses partenaires ou mainteneurs agréés) détermine que la réparation peut être effectuée à l'aide d'une pièce CSR, HP vous l'envoie directement. Il existe deux catégories de pièces CSR:

Obligatoire - Pièces pour lesquelles la réparation par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.

Facultatif - Pièces pour lesquelles la réparation par le client est facultative. Ces pièces sont également conçues pour permettre au client d'effectuer lui-même la réparation. Toutefois, si vous demandez à HP de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.

REMARQUE: Certaines pièces HP ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, HP exige que le remplacement de la pièce soit effectué par un Mainteneur Agréé. Ces pièces sont identifiées par la mention "Non" dans le Catalogue illustré.

Les pièces CSR sont livrées le jour ouvré suivant, dans la limite des stocks disponibles et selon votre situation géographique. Si votre situation géographique le permet et que vous demandez une livraison le jour même ou dans les 4 heures, celle-ci vous sera facturée. Pour bénéficier d'une assistance téléphonique, appelez le Centre d'assistance technique HP. Dans les documents envoyés avec la pièce de rechange CSR, HP précise s'il est nécessaire de lui retourner la pièce défectueuse. Si c'est le cas, vous devez le faire dans le délai indiqué, généralement cinq (5) jours ouvrés. La pièce et sa documentation doivent être retournées dans l'emballage fourni. Si vous ne retournez pas la pièce défectueuse, HP se réserve le droit de vous facturer les coûts de remplacement. Dans le cas d'une pièce CSR, HP supporte l'ensemble des frais d'expédition et de retour, et détermine la société de courses ou le transporteur à utiliser.

Pour plus d'informations sur le programme CSR de HP, contactez votre Mainteneur Agrée local. Pour plus d'informations sur ce programme en Amérique du Nord, consultez le site Web HP (http://www.hp.com/go/selfrepair).

Service de garantie "pièces seules"

Votre garantie limitée HP peut inclure un service de garantie "pièces seules". Dans ce cas, les pièces de rechange fournies par HP ne sont pas facturées.

Dans le cadre de ce service, la réparation des pièces CSR par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.

Riparazione da parte del cliente

Per abbreviare i tempi di riparazione e garantire una maggiore flessibilità nella sostituzione di parti difettose, i prodotti HP sono realizzati con numerosi componenti che possono essere riparati direttamente dal cliente (CSR, Customer Self Repair). Se in fase di diagnostica HP (o un centro di servizi o di assistenza HP) identifica il guasto come riparabile mediante un ricambio CSR, HP lo spedirà direttamente al cliente per la sostituzione. Vi sono due categorie di parti CSR:

Obbligatorie – Parti che devono essere necessariamente riparate dal cliente. Se il cliente ne affida la riparazione ad HP, deve sostenere le spese di spedizione e di manodopera per il servizio.

Opzionali – Parti la cui riparazione da parte del cliente è facoltativa. Si tratta comunque di componenti progettati per questo scopo. Se tuttavia il cliente ne richiede la sostituzione ad HP, potrebbe dover sostenere spese addizionali a seconda del tipo di garanzia previsto per il prodotto.

NOTA: alcuni componenti HP non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, HP richiede che queste parti siano sostituite da un centro di assistenza autorizzato. Tali parti sono identificate da un "No" nel Catalogo illustrato dei componenti.

In base alla disponibilità e alla località geografica, le parti CSR vengono spedite con consegna entro il giorno lavorativo seguente. La consegna nel giorno stesso o entro quattro ore è offerta con un supplemento di costo solo in alcune zone. In caso di necessità si può richiedere l'assistenza telefonica di un addetto del centro di supporto tecnico HP. Nel materiale fornito con una parte di ricambio CSR, HP specifica se il cliente deve restituire dei componenti. Qualora sia richiesta la resa ad HP del componente difettoso, lo si deve spedire ad HP entro un determinato periodo di tempo, generalmente cinque (5) giorni lavorativi. Il componente difettoso deve essere restituito con la documentazione associata nell'imballo di spedizione fornito. La mancata restituzione del componente può comportare la fatturazione del ricambio da parte di HP. Nel caso di riparazione da parte del cliente, HP sostiene tutte le spese di spedizione e resa e sceglie il corriere/vettore da utilizzare.

Per ulteriori informazioni sul programma CSR di HP contattare il centro di assistenza di zona. Per il programma in Nord America fare riferimento al sito Web HP (http://www.hp.com/go/selfrepair).

Servizio di garanzia per i soli componenti

La garanzia limitata HP può includere un servizio di garanzia per i soli componenti. Nei termini di garanzia del servizio per i soli componenti, HP fornirà gratuitamente le parti di ricambio.

Per il servizio di garanzia per i soli componenti è obbligatoria la formula CSR che prevede la riparazione da parte del cliente. Se il cliente invece richiede la sostituzione ad HP, dovrà sostenere le spese di spedizione e di manodopera per il servizio.

Customer Self Repair

HP Produkte enthalten viele CSR-Teile (Customer Self Repair), um Reparaturzeiten zu minimieren und höhere Flexibilität beim Austausch defekter Bauteile zu ermöglichen. Wenn HP (oder ein HP Servicepartner) bei der Diagnose feststellt, dass das Produkt mithilfe eines CSR-Teils repariert werden kann, sendet Ihnen HP dieses Bauteil zum Austausch direkt zu. CSR-Teile werden in zwei Kategorien unterteilt:

Zwingend – Teile, für die das Customer Self Repair-Verfahren zwingend vorgegeben ist. Wenn Sie den Austausch dieser Teile von HP vornehmen lassen, werden Ihnen die Anfahrt- und Arbeitskosten für diesen Service berechnet.

Optional – Teile, für die das Customer Self Repair-Verfahren optional ist. Diese Teile sind auch für Customer Self Repair ausgelegt. Wenn Sie jedoch den Austausch dieser Teile von HP vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.

HINWEIS: Einige Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem HP Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No“ bzw. „Nein“ gekennzeichnet.

CSR-Teile werden abhängig von der Verfügbarkeit und vom Lieferziel am folgenden Geschäftstag geliefert. Für bestimmte Standorte ist eine Lieferung am selben Tag oder innerhalb von vier Stunden gegen einen Aufpreis verfügbar. Wenn Sie Hilfe benötigen, können Sie das HP technische Support Center anrufen und sich von einem Mitarbeiter per Telefon helfen lassen. Den Materialien, die mit einem CSR-Ersatzteil geliefert werden, können Sie entnehmen, ob das defekte Teil an HP zurückgeschickt werden muss. Wenn es erforderlich ist, das defekte Teil an HP zurückzuschicken, müssen Sie dies innerhalb eines vorgegebenen Zeitraums tun, in der Regel innerhalb von fünf (5) Geschäftstagen. Das defekte Teil muss mit der zugehörigen Dokumentation in der Verpackung zurückgeschickt werden, die im Lieferumfang enthalten ist. Wenn Sie das

defekte Teil nicht zurückschicken, kann HP Ihnen das Ersatzteil in Rechnung stellen. Im Falle von Customer Self Repair kommt HP für alle Kosten für die Lieferung und Rücksendung auf und bestimmt den Kurier-/Frachtdienst.

Weitere Informationen über das HP Customer Self Repair Programm erhalten Sie von Ihrem Servicepartner vor Ort. Informationen über das CSR-Programm in Nordamerika finden Sie auf der HP Website unter (http://www.hp.com/go/selfrepair).

Parts-only Warranty Service (Garantieservice ausschließlich für Teile)

Ihre HP Garantie umfasst möglicherweise einen Parts-only Warranty Service (Garantieservice ausschließlich für Teile). Gemäß den Bestimmungen des Parts-only Warranty Service stellt HP Ersatzteile kostenlos zur Verfügung.

Für den Parts-only Warranty Service ist das CSR-Verfahren zwingend vorgegeben. Wenn Sie den Austausch dieser Teile von HP vornehmen lassen, werden Ihnen die Anfahrt- und Arbeitskosten für diesen Service berechnet.

Reparaciones del propio cliente

Los productos de HP incluyen muchos componentes que el propio usuario puede reemplazar (*Customer Self Repair*, CSR) para minimizar el tiempo de reparación y ofrecer una mayor flexibilidad a la hora de realizar sustituciones de componentes defectuosos. Si, durante la fase de diagnóstico, HP (o los proveedores o socios de servicio de HP) identifica que una reparación puede llevarse a cabo mediante el uso de un componente CSR, HP le enviará dicho componente directamente para que realice su sustitución. Los componentes CSR se clasifican en dos categorías:

- **Obligatorio:** componentes para los que la reparación por parte del usuario es obligatoria. Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.
- **Opcional:** componentes para los que la reparación por parte del usuario es opcional. Estos componentes también están diseñados para que puedan ser reparados por el usuario. Sin embargo, si precisa que HP realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.

NOTA: Algunos componentes no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, HP pone como condición que un proveedor de servicios autorizado realice la sustitución de estos componentes. Dichos componentes se identifican con la palabra "No" en el catálogo ilustrado de componentes.

Según la disponibilidad y la situación geográfica, los componentes CSR se enviarán para que lleguen a su destino al siguiente día laborable. Si la situación geográfica lo permite, se puede solicitar la entrega en el mismo día o en cuatro horas con un coste adicional. Si precisa asistencia técnica, puede llamar al Centro de asistencia técnica de HP y recibirá ayuda telefónica por parte de un técnico. Con el envío de materiales para la sustitución de componentes CSR, HP especificará si los componentes defectuosos deberán devolverse a HP. En aquellos casos en los que sea necesario devolver algún componente a HP, deberá hacerlo en el periodo de tiempo especificado, normalmente cinco días laborables. Los componentes defectuosos deberán devolverse con toda la documentación relacionada y con el embalaje de envío. Si no

enviara el componente defectuoso requerido, HP podrá cobrarle por el de sustitución. En el caso de todas sustituciones que lleve a cabo el cliente, HP se hará cargo de todos los gastos de envío y devolución de componentes y escogerá la empresa de transporte que se utilice para dicho servicio.

Para obtener más información acerca del programa de Reparaciones del propio cliente de HP, póngase en contacto con su proveedor de servicios local. Si está interesado en el programa para Norteamérica, visite la página web de HP siguiente (http://www.hp.com/go/selfrepair).

Servicio de garantía exclusivo de componentes

La garantía limitada de HP puede que incluya un servicio de garantía exclusivo de componentes. Según las condiciones de este servicio exclusivo de componentes, HP le facilitará los componentes de repuesto sin cargo adicional alguno.

Para este servicio de garantía exclusivo de componentes, es obligatoria la sustitución de componentes por parte del usuario (CSR). Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.

Customer Self Repair

Veel onderdelen in HP producten zijn door de klant zelf te repareren, waardoor de reparatieduur tot een minimum beperkt kan blijven en de flexibiliteit in het vervangen van defecte onderdelen groter is. Deze onderdelen worden CSR-onderdelen (Customer Self Repair) genoemd. Als HP (of een HP Service Partner) bij de diagnose vaststelt dat de reparatie kan worden uitgevoerd met een CSR-onderdeel, verzendt HP dat onderdeel rechtstreeks naar u, zodat u het defecte onderdeel daarmee kunt vervangen. Er zijn twee categorieën CSR-onderdelen:

Verplicht: Onderdelen waarvoor reparatie door de klant verplicht is. Als u HP verzoekt deze onderdelen voor u te vervangen, worden u voor deze service reiskosten en arbeidsloon in rekening gebracht.

Optioneel: Onderdelen waarvoor reparatie door de klant optioneel is. Ook deze onderdelen zijn ontworpen voor reparatie door de klant. Als u echter HP verzoekt deze onderdelen voor u te vervangen, kunnen daarvoor extra kosten in rekening worden gebracht, afhankelijk van het type garantieservice voor het product.

OPMERKING: Sommige HP onderdelen zijn niet ontwikkeld voor reparatie door de klant. In verband met de garantievoorwaarden moet het onderdeel door een geautoriseerde Service Partner worden vervangen. Deze onderdelen worden in de geïllustreerde onderdelencatalogus aangemerkt met "Nee".

Afhankelijk van de leverbaarheid en de locatie worden CSR-onderdelen verzonden voor levering op de eerstvolgende werkdag. Levering op dezelfde dag of binnen vier uur kan tegen meerkosten worden aangeboden, indien dit mogelijk is gezien de locatie. Indien assistentie gewenst is, belt u een HP Service Partner om via de telefoon technische ondersteuning te ontvangen. HP vermeldt in de documentatie bij het vervangende CSR-onderdeel of het defecte onderdeel aan HP moet worden geretourneerd. Als het defecte onderdeel aan HP moet worden teruggezonden, moet u het defecte onderdeel binnen een bepaalde periode, gewoonlijk vijf (5) werkdagen, retourneren aan HP. Het defecte onderdeel moet met de bijbehorende documentatie worden geretourneerd in het meegeleverde verpakkingsmateriaal. Als u het defecte onderdeel niet terugzendt, kan HP u voor het vervangende onderdeel kosten in rekening brengen. Bij reparatie door de klant betaalt HP alle verzendkosten voor het vervangende en geretourneerde onderdeel en kiest HP zelf welke koerier/transportonderneming hiervoor wordt gebruikt.

Neem contact op met een Service Partner voor meer informatie over het Customer Self Repair programma van HP. Informatie over Service Partners vindt u op de HP website (http://www.hp.com/go/selfrepair).

Garantieservice "Parts Only"

Het is mogelijk dat de HP garantie alleen de garantieservice "Parts Only" omvat. Volgens de bepalingen van de Parts Only garantieservice zal HP kosteloos vervangende onderdelen ter beschikking stellen.

Voor de Parts Only garantieservice is vervanging door CSR-onderdelen verplicht. Als u HP verzoekt deze onderdelen voor u te vervangen, worden u voor deze service reiskosten en arbeidsloon in rekening gebracht.

Reparo feito pelo cliente

Os produtos da HP são projetados com muitas peças para reparo feito pelo cliente (CSR) de modo a minimizar o tempo de reparo e permitir maior flexibilidade na substituição de peças com defeito. Se, durante o período de diagnóstico, a HP (ou fornecedores/parceiros de serviço da HP) concluir que o reparo pode ser efetuado pelo uso de uma peça CSR, a peça de reposição será enviada diretamente ao cliente. Existem duas categorias de peças CSR:

Obrigatória – Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.

Opcional – Peças cujo reparo feito pelo cliente é opcional. Essas peças também são projetadas para o reparo feito pelo cliente. No entanto, se desejar que a HP as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.

OBSERVAÇÃO: Algumas peças da HP não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a HP exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca "No" (Não), no catálogo de peças ilustrado.

Conforme a disponibilidade e o local geográfico, as peças CSR serão enviadas no primeiro dia útil após o pedido. Onde as condições geográficas permitirem, a entrega no mesmo dia ou em quatro horas pode ser feita mediante uma taxa adicional. Se precisar de auxílio, entre em contato com o Centro de suporte técnico da HP para que um técnico o ajude por telefone. A HP especifica nos materiais fornecidos com a peça CSR de reposição se a peça com defeito deve ser devolvida à HP. Nos casos em que isso for necessário, é preciso enviar a peça com defeito à HP dentro do período determinado, normalmente cinco (5) dias úteis. A peça com defeito deve ser enviada com a documentação correspondente no material de transporte fornecido. Caso não o faça, a HP poderá cobrar a reposição. Para as peças de reparo feito pelo cliente, a HP paga todas as despesas de transporte e de devolução da peça e determina a transportadora/serviço postal a ser utilizado.

Para obter mais informações sobre o programa de reparo feito pelo cliente da HP, entre em contato com o fornecedor de serviços local. Para o programa norte-americano, visite o site da HP (http://www.hp.com/go/selfrepair).

Serviço de garantia apenas para peças

A garantia limitada da HP pode incluir um serviço de garantia apenas para peças. Segundo os termos do serviço de garantia apenas para peças, a HP fornece as peças de reposição sem cobrar nenhuma taxa.

No caso desse serviço, a substituição de peças CSR é obrigatória. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.

カスタマーセルフリペア

修理時間を短縮し、故障部品の交換における高い柔軟性を確保するために、HP製品には多数のCSR部品があります。診断の際に、CSR部品を使用すれば修理ができるとHP（HPまたはHP正規保守代理店）が判断した場合、HPはその部品を直接、お客様に発送し、お客様に交換していただきます。CSR部品には以下の2通りがあります。

- **必須 -** カスタマーセルフリペアが必須の部品。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費がお客様に請求されます。
- **任意 -** カスタマーセルフリペアが任意である部品。この部品もカスタマーセルフリペア用です。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、お買い上げの製品に適用される保証サービス内容の範囲内においては、別途費用を負担していただくことなく保証サービスを受けることができます。

注： HP製品の一部の部品は、カスタマーセルフリペア用ではありません。製品の保証を継続するためには、HPまたはHP正規保守代理店による交換作業が必須となります。部品カタログには、当該部品がカスタマーセルフリペア除外品である旨が記載されています。

部品供給が可能な場合、地域によっては、CSR部品を翌営業日に届くように発送します。また、地域によっては、追加費用を負担いただくことにより同日または4時間以内に届くように発送することも可能な場合があります。サポートが必要なときは、HPの修理受付窓口に電話していただければ、技術者が電話でアドバイスします。交換用のCSR部品または同梱物には、故障部品をHPに返送する必要があるかどうかが表示されています。故障部品をHPに返送する必要がある場合は、指定期限内（通常は5営業日以内）に故障部品をHPに返送してください。故障部品を返送する場合は、届いた時の梱包箱に関連書類とともに入れてください。故障部品を返送しない場合、HPから部品費用が請求されます。カスタマーセルフリペアの際には、HPは送料および部品返送費を全額負担し、使用する宅配便会社や運送会社を指定します。

部品のみ保証サービス

HP保証サービスには、部品のみ保証サービスが適用される場合があります。このサービスでは、交換部品は無償で提供されます。

部品のみ保証サービスにおいては、CSR部品をお客様により交換作業していただくことが必須となります。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費はお客様の負担となります。

客户自行维修

HP 产品提供许多客户自行维修 (CSR) 部件，以尽可能缩短维修时间和在更换缺陷部件方面提供更大的灵活性。如果在诊断期间 HP（或 HP 服务提供商或服务合作伙伴）确定可以通过使用 CSR 部件完成维修，HP 将直接把该部件发送给您进行更换。有两类 CSR 部件：

- **强制性的** — 要求客户必须自行维修的部件。如果您请求 HP 更换这些部件，则必须为该服务支付差旅费和人工费用。
- **可选的** — 客户可以选择是否自行维修的部件。这些部件也是为客户自行维修设计的。不过，如果您要求 HP 为您更换这些部件，则根据为您的产品指定的保修服务类型，HP 可能收取或不再收取任何附加费用。

注：某些 HP 部件的设计并未考虑客户自行维修。为了满足客户保修的需要，HP 要求授权服务提供商更换相关部件。这些部件在部件图解目录中标记为“否”。

CSR 部件将在下一个工作日发运（取决于备货情况和允许的地理范围）。在允许的地理范围内，可在当天或四小时内发运，但要收取额外费用。如果需要帮助，您可以致电 HP 技术支持中心，将会有技术人员通过电话为您提供帮助。HP 会在随更换的 CSR 部件发运的材料中指明是否必须将有缺陷的部件返还给 HP。如果要求您将有缺陷的部件返还给 HP，那么您必须在规定期限内（通常是五 (5) 个工作日）将缺陷部件发给 HP。有缺陷的部件必须随所提供的发运材料中的相关文件一起返还。如果未能送还有缺陷的部件，HP 可能会要求您支付更换费用。客户自行维修时，HP 将承担所有相关运输和部件返回费用，并指定快递商/承运商。

有关 HP 客户自行维修计划的详细信息，请与您当地的服务提供商联系。有关北美地区的计划，请访问 HP 网站 (http://www.hp.com/go/selfrepair)。

仅部件保修服务

您的 HP 有限保修服务可能涉及仅部件保修服务。根据仅部件保修服务条款的规定，HP 将免费提供更换的部件。

仅部件保修服务要求进行 CSR 部件更换。如果您请求 HP 更换这些部件，则必须为该服务支付差旅费和人工费用。

客戶自行維修

HP 產品設計了許多「客戶自行維修」(CSR) 的零件以減少維修時間，並且使得更換瑕疵零件時能有更大的彈性。如果在診斷期間 HP（或 HP 服務供應商或維修夥伴）辨認出此項維修工作可以藉由使用 CSR 零件來完成，則 HP 將直接寄送該零件給您作更換。CSR 零件分為兩種類別：

- **強制的** — 客戶自行維修所使用的零件是強制性的。如果您要求 HP 更換這些零件，HP 將會向您收取此服務所需的外出費用與勞動成本。
- **選購的** — 客戶自行維修所使用的零件是選購的。這些零件也設計用於客戶自行維修之用。不過，如果您要求 HP 為您更換，則可能需要也可能不需要負擔額外的費用，端視針對此產品指定的保固服務類型而定。

備註：某些 HP 零件沒有消費者可自行維修的設計。為符合客戶保固，HP 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

基於材料取得及環境允許的情況下，CSR 零件將於下一個工作日以快遞寄送。在環境的允許下當天或四小時內送達，則可能需要額外的費用。若您需要協助，可致電「HP 技術支援中心」，會有一位技術人員透過電話來協助您。不論損壞的零件是否必須退回，HP 皆會在與 CSR 替換零件一起運送的材料中註明。若要將損壞的零件退回 HP，您必須在指定的一段時間內（通常為五 (5) 個工作天），將損壞的零件寄回 HP。損壞的零件必須與寄送資料中隨附的相關技術文件一併退還。如果無法退還損壞的零件，HP 可能要向您收取替換費用。針對客戶自行維修情形，HP 將負責所有運費及零件退還費用並指定使用何家快遞/貨運公司。

如需 HP 的「客戶自行維修」方案詳細資訊，請連絡您當地的服務供應商。至於北美方案，請參閱 HP 網站 (http://www.hp.com/go/selfrepair)。

僅限零件的保固服務

您的「HP 有限保固」可能包含僅限零件的保固服務。在僅限零件的保固服務情況下，HP 將免費提供替換零件。

針對僅限零件的保固服務，CSR 零件替換是強制性的。如果您要求 HP 更換這些零件，HP 將會向您收取此服務所需的外出費用與勞動成本。

고객 셀프 수리

HP 제품은 수리 시간을 최소화하고 결함이 있는 부품 교체 시 더욱 융통성을 발휘할 수 있도록 하기 위해 고객 셀프 수리(CSR) 부품을 다량 사용하여 설계되었습니다. 진단 기간 동안 HP(또는 HP 서비스 공급업체 또는 서비스 협력업체)에서 CSR 부품을 사용하여 수리가 가능하다고 판단되면 HP는 해당 부품을 바로 사용자에게 보내어 사용자가 교체할 수 있도록 합니다. CSR 부품에는 두 가지 종류가 있습니다.

- **고객 셀프 수리가 의무 사항인 필수 부품.** 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.
- **고객 셀프 수리가 선택 사항인 부품.** 이 부품들도 고객 셀프 수리가 가능하도록 설계되었습니다. 하지만 사용자가 HP에 이 부품의 교체를 요청할 경우 사용자가 구입한 제품에 해당하는 보증 서비스 유형에 따라 추가 비용 없이 교체가 가능할 수 있습니다.

참고: 일부 HP 부품은 고객 셀프 수리가 불가능하도록 설계되었습니다. HP는 만족스러운 고객 보증을 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 하고 있습니다. 이러한 부품들은 Illustrated Parts Catalog에 "No"라고 표시되어 있습니다.

CSR 부품은 재고 상태와 지리적 조건이 허용하는 경우 다음 영업일 납품이 가능하도록 배송이 이루어집니다. 지리적 조건이 허용하는 경우 추가 비용이 청구되는 조건으로 당일 또는 4시간 배송이 가능할 수도 있습니다. 도움이 필요하시면 HP 기술 지원 센터로 전화하십시오. 전문 기술자가 전화로 도움을 줄 것입니다. HP는 결함이 발생한 부품을 HP로 반환해야 하는지 여부를 CSR 교체 부품과 함께 배송된 자료에 지정합니다. 결함이 발생한 부품을 HP로 반환해야 하는 경우에는 지정된 기간 내(통상 영업일 기준 5일)에 HP로 반환해야 합니다. 이 때 결함이 발생한 부품은 제공된 포장 재료에 넣어 관련 설명서와 함께 반환해야 합니다. 결함이 발생한 부품을 반환하지 않는 경우 HP가 교체 부품에 대해 비용을 청구할 수 있습니다. 고객 셀프 수리의 경우, HP는 모든 운송 및 부품 반환 비용을 부담하며 이용할 운송업체 및 택배 서비스를 결정합니다.

HP 고객 셀프 수리 프로그램에 대한 자세한 내용은 가까운 서비스 제공업체에 문의하십시오. 북미 지역의 프로그램에 대해서는 HP 웹 사이트(http://www.hp.com/go/selfrepair)를 참조하십시오.

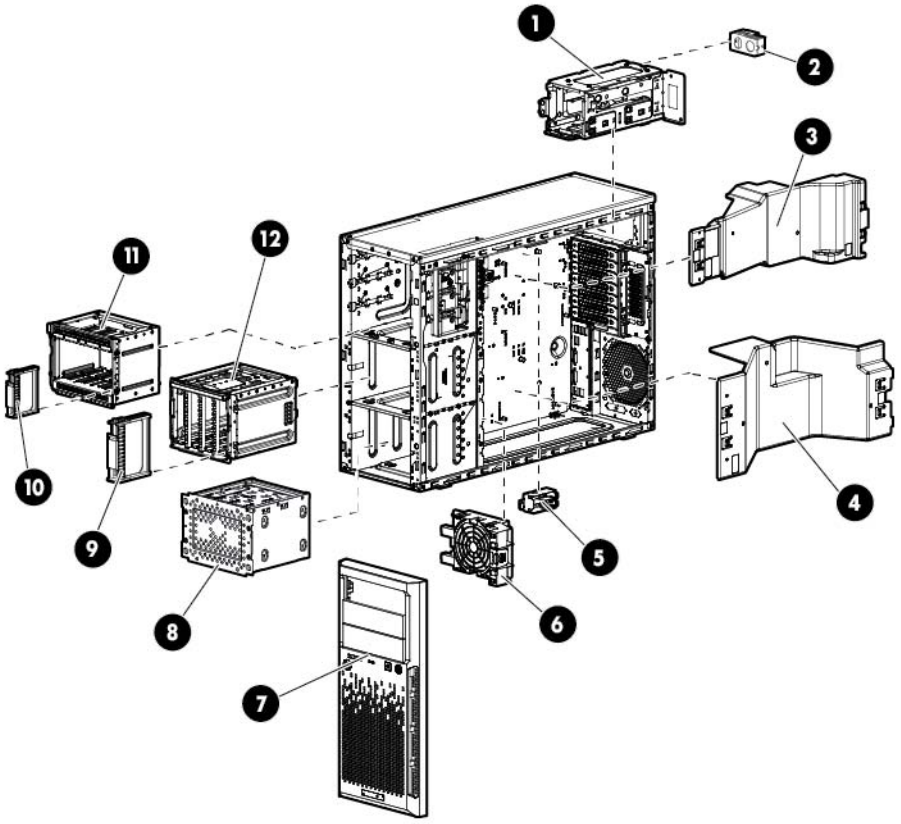
부품 제공 보증 서비스

HP 제한 보증에는 부품 제공 보증 서비스가 포함될 수 있습니다. 이러한 경우 HP는 부품 제공 보증 서비스의 조건에 따라 교체 부품만을 무료로 제공합니다.

부품 제공 보증 서비스 제공 시 CSR 부품 교체는 의무 사항입니다. 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.

Illustrated parts catalog

Mechanical components



Item	Description	Spare part number	Customer self repair (on page 5)
1	RPS cage assembly	685046-001	Optional[2]
2	Power supply blank, common slot	698883-001	Mandatory[1]
3	PCI air baffle	746472-001	Optional[2]
4	System air baffle	747000-001	Mandatory[1]
5	Capacitor pack holder	685047-001	Mandatory[1]
6	Fan holder 3 (with blank)	746471-001	Mandatory[1]
7	Front bezel	747001-001	Mandatory[1]
8	Non-hot-plug drive cage	519734-002	Mandatory[1]
9	LFF drive blank	667279-001	Mandatory[1]
10	SFF drive blank	667276-001	Mandatory[1]
11	8 SFF hot-plug drive cage	686753-002	Mandatory[1]
12	4 LFF hot-plug drive cage	686745-002	Mandatory[1]

* Not shown
[1]Mandatory—Parts for which customer self repair is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.
[2]Optional—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that HP replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.
[3]No—Some HP parts are not designed for customer self repair. In order to satisfy the customer warranty, HP requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

[1]Mandatory: Obligatoire—Pièces pour lesquelles la réparation par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.
[2]Optional: Facultatif—Pièces pour lesquelles la réparation par le client est facultative. Ces pièces sont également conçues pour permettre au client d'effectuer lui-même la réparation. Toutefois, si vous demandez à HP de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.
[3]No: Non—Certaines pièces HP ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, HP exige que le remplacement de la pièce soit effectué par un Mainteneur Agréé. Ces pièces sont identifiées par la mention “Non” dans le Catalogue illustré.

[1]Mandatory: Obbligatorie—Parti che devono essere necessariamente riparate dal cliente. Se il cliente ne affida la riparazione ad HP, deve sostenere le spese di spedizione e di manodopera per il servizio.
[2]Optional: Opzionali—Parti la cui riparazione da parte del cliente è facoltativa. Si tratta comunque di componenti progettati per questo scopo. Se tuttavia il cliente ne richiede la sostituzione ad HP, potrebbe dover sostenere spese addizionali a seconda del tipo di garanzia previsto per il prodotto.
[3]No: Non CSR—Alcuni componenti HP non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, HP richiede che queste parti siano sostituite da un centro di assistenza autorizzato. Tali parti sono identificate da un “No” nel Catalogo illustrato dei componenti.

[1]Mandatory: Zwingend—Teile, die im Rahmen des Customer Self Repair Programms ersetzt werden müssen. Wenn Sie diese Teile von HP ersetzen lassen, werden Ihnen die Versand- und Arbeitskosten für diesen Service berechnet.
[2]Optional: Optional—Teile, für die das Customer Self Repair-Verfahren optional ist. Diese Teile sind auch für Customer Self Repair ausgelegt. Wenn Sie jedoch den Austausch dieser Teile von HP vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.
[3]No: Kein—Einige Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem HP Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No“ bzw. „Nein“ gekennzeichnet.

[1]Mandatory: Obligatorio—componentes para los que la reparación por parte del usuario es obligatoria. Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.
[2]Optional: Opcional— componentes para los que la reparación por parte del usuario es opcional. Estos componentes también están diseñados para que puedan ser reparados por el usuario. Sin embargo, si precisa que HP realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.
[3]No: No—Algunos componentes no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, HP pone como condición que un proveedor de servicios autorizado realice la sustitución de estos componentes. Dichos componentes se identifican con la palabra “No” en el catálogo ilustrado de componentes.

[1]Mandatory: Verplicht—Onderdelen waarvoor Customer Self Repair verplicht is. Als u HP verzoekt deze onderdelen te vervangen, komen de reiskosten en het arbeidsloon voor uw rekening.
[2]Optional: Optioneel—Onderdelen waarvoor reparatie door de klant optioneel is. Ook deze onderdelen zijn ontworpen voor reparatie door de klant. Als u echter HP verzoekt deze onderdelen voor u te vervangen, kunnen daarvoor extra kosten in rekening worden gebracht, afhankelijk van het type garantieservice voor het product.
[3]No: Nee—Sommige HP onderdelen zijn niet ontwikkeld voor reparatie door de klant. In verband met de garantievoorwaarden moet het onderdeel door een geautoriseerde Service Partner worden vervangen. Deze onderdelen worden in de geïllustreerde onderdelencatalogus aangemerkt met "Nee".

[1]Mandatory: Obrigatória—Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.
[2]Optional: Opcional—Peças cujo reparo feito pelo cliente é opcional. Essas peças também são projetadas para o reparo feito pelo cliente. No entanto, se desejar que a HP as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.
[3]No: Nenhuma—Algumas peças da HP não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a HP exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca "No" (Não), no catálogo de peças ilustrado.

[1]Mandatory：必須 - 顧客自己修理が必須の部品。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費がお客様に請求されます。

[2]Optional：任意 - 顧客自己修理が任意である部品。この部品も顧客自己修理用です。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、お買い上げの製品に適用される保証サービス内容の範囲内においては、費用を負担していただくことなく保証サービスを受けることができます。

[3]No：除外 - HP製品の一部の部品は、顧客自己修理用ではありません。製品の保証を継続するためには、HPまたはHP正規保守代理店による交換作業が必須となります。部品カタログには、当該部品が顧客自己修理除外品である旨が記載されています。

[1]Mandatory: 强制性的 — 要求客户必须自行维修的部件。如果您请求 HP 更换这些部件，则必须为该服务支付差旅费和人工费用。

[2]Optional: 可选的 — 客户可以选择是否自行维修的部件。这些部件也是为客户自行维修设计的。不过，如果您要求 HP 为您更换这些部件，则根据为您的产品指定的保修服务类型，HP 可能收取或不再收取任何附加费用。

[3]No: 否 — 某些 HP 部件的设计并未考虑客户自行维修。为了满足客户保修的需要，HP 要求授权服务提供商更换相关部件。这些部件在部件图解目录中标记为“否”。

[1]Mandatory: 強制的 — 客戶自行維修所使用的零件是強制性的。如果您要求 HP 更換這些零件，HP 將會向您收取此服務所需的外出費用與勞動成本。

[2]Optional: 選購的 — 客戶自行維修所使用的零件是選購的。這些零件也設計用於客戶自行維修之用。不過，如果您要求 HP 為您更換，則可能需要也可能不需要負擔額外的費用，端視針對此產品指定的保固服務類型而定。

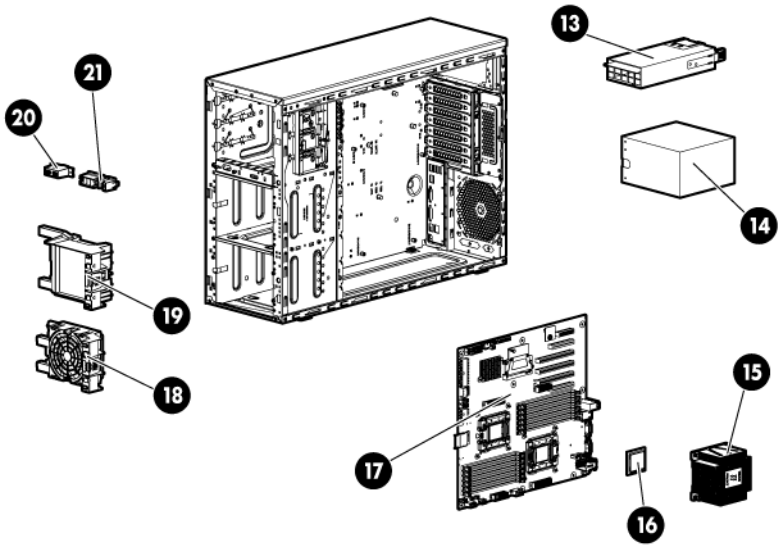
[3]No: 否 — 某些 HP 零件沒有消費者可自行維修的設計。為符合客戶保固，HP 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

[1] Mandatory: 필수 — 고객 셀프 수리가 의무 사항인 필수 부품. 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.

[2] Optional: 옵션 — 고객 셀프 수리가 선택 사항인 부품. 이 부품들도 고객 셀프 수리가 가능하도록 설계되었습니다. 하지만 사용자가 HP에 이 부품의 교체를 요청할 경우 사용자가 구입한 제품에 해당하는 보증 서비스 유형에 따라 추가 비용 없이 교체가 가능할 수 있습니다.

[3] No: No — 고객 셀프 수리가 불가능하도록 설계된 HP 부품. 이 부품들은 고객 셀프 수리가 불가능하도록 설계되었습니다. HP는 고객 보증을 만족시키기 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 하고 있습니다.

System components



Item	Description	Spare part number	Customer self repair (on page 5)
13	Common slot power supply modules	—	—
	a) 460 W, Common slot power supply (94% efficiency)	660184-001	Optional[2]
	b) 750 W, Common slot power supply (94% efficiency)*	660183-001	Optional[2]
14	460 W integrated power supply assembly	685041-001	Mandatory[1]
15	Heatsink	687456-001	Mandatory[1]
16	Processors**	—	—
	a) 1.8-GHz Intel Xeon E5-2403 processor, 4C, 10 MB, 80 W	676949-001	Optional[2]
	b) 1.8-GHz Intel Xeon E5-2403 v2 processor, 4C, 10 MB, 80 W*	729109-001	Optional[2]
	c) 1.8-GHz Intel Xeon E5-2450L processor, 8C, 20 MB, 70 W*	676951-001	Optional[2]
	d) 1.9-GHz Intel Xeon E5-2420 processor, 6C, 15 MB, 95 W*	676947-001	Optional[2]
	e) 1.9-GHz Intel Xeon E5-2440 v2 processor, 8C, 20 MB, 95 W*	729113-001	Optional[2]
	f) 2.0-GHz Intel Xeon E5-2430L processor, 6C, 15 MB, 60 W*	676950-001	Optional[2]
	g) 2.1-GHz Intel Xeon E5-2450 processor, 8C, 20 MB, 95 W*	676944-001	Optional[2]
	h) 2.2-GHz Intel Xeon E5-2407 processor, 4C, 10 MB, 80 W*	676948-001	Optional[2]
	i) 2.2-GHz Intel Xeon E5-2407 v2 processor, 4C, 10 MB, 80 W*	729110-001	Optional[2]
	j) 2.2-GHz Intel Xeon E5-2420 v2 processor, 6C, 15 MB, 80 W*	729111-001	Optional[2]
	k) 2.2-GHz Intel Xeon E5-2430 processor, 6C, 15 MB, 95 W*	676946-001	Optional[2]
	l) 2.3-GHz Intel Xeon E5-2470 processor, 8C, 20 MB, 95	676943-001	Optional[2]

	W*		
	m) 2.4-GHz Intel Xeon E5-2407 v2 processor, 4C, 10 MB, 80 W*	729110-001	Optional[2]
	n) 2.4-GHz Intel Xeon E5-2440 processor, 6C, 15 MB, 95 W*	676945-001	Optional[2]
	o) 2.5-GHz Intel Xeon E5-2430 v2 processor, 6C, 15 MB, 80 W*	729112-001	Optional[2]
	p) 2.5-GHz Intel Xeon E5-2450 v2 processor, 8C, 20 MB, 95 W*	729114-001	Optional[2]
17	System board assemblies	—	—
	a) System board assembly (for use with Xeon E5 2400 processor systems)	746466-001	Optional[2]
	b) System board assembly (for use with Xeon E5 2400 v2 processor systems)*	757484-001	Optional[2]
18	Fan holder 2/3 (with fan)	746470-001	Mandatory[1]
19	Fan holder 1 (with fan)	746469-001	Mandatory[1]
20	Front USB module	746468-001	Mandatory[1]
21	Front panel LED/buttons module	746467-001	Mandatory[1]
22	RPS backplane*	685045-001	Optional[2]
23	Cable kit*	685051-001	Optional[2]
	a) Processor 2 power cable	—	—
	b) Box 2 drive power cable	—	—
	c) Non-hot-plug drive cable assembly	—	—
	d) Hot-plug drive mini-SAS cable	—	—
24	4 LFF mini-SAS cable*	729106-001	Mandatory[1]
25	8 SFF mini-SAS cable*	746473-001	Mandatory[1]
26	Mini-SAS cable assembly*	682626-001	Mandatory[1]
27	Hot-plug drive backplane, SFF*	686759-002	Optional[2]
28	Hot-plug drive backplane, LFF*	686756-002	Optional[2]
29	DIMMs*	—	—
	a) 2 GB, single-rank, x8, PC3L-10600E-9	664694-001	Mandatory[1]
	b) 2 GB, single-rank, x8, PC3-12800E-11	684033-001	Mandatory[1]
	c) 2 GB, single-rank, x8, PC3L-12800E-11	715279-001	Mandatory[1]
	d) 4 GB, single-rank, x4, PC3L-10600R-9	664688-001	Mandatory[1]
	e) 4 GB, single-rank, x4, PC3-12800R-11	664689-001	Mandatory[1]
	f) 4 GB, single-rank, x4, PC3L-12800R-11	715282-001	Mandatory[1]
	g) 4 GB, dual-rank, x8, PC3L-10600E-9	664695-001	Mandatory[1]
	h) 4 GB, dual-rank, x8, PC3-12800E-11	684034-001	Mandatory[1]
	i) 4 GB, dual-rank, x8, PC3L-12800E-11	715280-001	Mandatory[1]
	j) 8 GB, single-rank, x4, PC3-12800R-11	664691-001	Mandatory[1]
	k) 8 GB, dual-rank, x4, PC3L-10600R-9	664690-001	Mandatory[1]
	l) 8 GB, dual-rank, x4, PC3-12800R-11	698807-001	Mandatory[1]
	m) 8 GB, dual-rank, x4, PC3L-12800R-11	715283-001	Mandatory[1]

	n) 8 GB, dual-rank, x8, PC3L-10600E-9	664696-001	Mandatory[1]
	o) 8 GB, dual-rank, x8, PC3-12800E-11	684035-001	Mandatory[1]
	p) 8 GB, dual-rank, x8, PC3L-12800E-11	715281-001	Mandatory[1]
	q) 16 GB, dual-rank, x4, PC3L-10600R-9	664692-001	Mandatory[1]
	r) 16 GB, dual-rank, x4, PC3-12800R-11	684031-001	Mandatory[1]
	s) 16 GB, dual-rank, x4, PC3L-12800R-11	715284-001	Mandatory[1]
30	LFF non-hot-plug SATA hard drives (8.89 cm, 3.5 in)*	—	—
	a) 500 GB, 6 G, 7,200-rpm hard drive	659571-001	Mandatory[1]
	b) 1 TB, 6 G, 7,200-rpm hard drive	659569-001	Mandatory[1]
	c) 2 TB, 6 G, 7,200-rpm hard drive	659570-001	Mandatory[1]
31	LFF hot-plug drives (8.89 cm, 3.5 in)*	—	—
	SATA drives	—	—
	a) 100 GB, 3 G solid state drive	653968-001	Mandatory[1]
	b) 500 GB, 6 G, 7,200-rpm hard drive	658103-001	Mandatory[1]
	c) 1 TB, 6 G, 7,200-rpm hard drive	657739-001	Mandatory[1]
	d) 2 TB, 6 G, 7,200-rpm hard drive	658102-001	Mandatory[1]
	SAS drives	—	—
	a) 450 GB, 6 G, 15,000-rpm hard drive	653951-001	Mandatory[1]
	b) 600 GB, 6 G, 15,000-rpm hard drive	653952-001	Mandatory[1]
	c) 1 TB, 6 G, 7,200-rpm hard drive	537786-001	Mandatory[1]
	d) 2 TB, 6 G, 7,200-rpm hard drive	653948-001	Mandatory[1]
	e) 3 TB, 6 G, 7,200-rpm hard drive	653959-001	Mandatory[1]
32	SFF hot-plug drives (6.35 cm, 2.5 in)*	—	—
	SATA drives*	—	—
	a) 100 GB,3 G solid state drive	653965-001	Mandatory[1]
	b) 500 GB, 6 G, 7,200-rpm hard drive	656107-001	Mandatory[1]
	c) 1 TB, 6 G, 7,200-rpm hard drive	656108-001	Mandatory[1]
	SAS drives	—	—
	a) 146 GB, 6 G, 15,000-rpm hard drive	504334-001	Mandatory[1]
	b) 300 GB, 6 G, 10,000-rpm hard drive	653955-001	Mandatory[1]
	c) 300 GB, 6 G, 15,000-rpm hard drive	653960-001	Mandatory[1]
	d) 500 GB, 6 G, 7,200-rpm hard drive	508009-001	Mandatory[1]
	e) 450 GB, 6 G, 10,000-rpm hard drive	653956-001	Mandatory[1]
	f) 600 GB, 6 G, 10,000-rpm hard drive	653957-001	Mandatory[1]
	g) 900 GB, 6 G, 10,000-rpm hard drive	619463-001	Mandatory[1]
	h) 1 TB, 6 G, 7,200-rpm hard drive	653954-001	Mandatory[1]
	i) 1.2 TB, 6 G, 10,000-rpm hard drive	718292-001	Mandatory[1]

33	System battery*	234556-001	Mandatory[1]

*Not shown

**Do not mix single-core, dual-core, or quad-core processors, or processors with different cache sizes, speeds, or power consumption.

[1]Mandatory—Parts for which customer self repair is mandatory. If you request HP to replace these parts, you will be charged for the travel and labor costs of this service.

[2]Optional—Parts for which customer self repair is optional. These parts are also designed for customer self repair. If, however, you require that HP replace them for you, there may or may not be additional charges, depending on the type of warranty service designated for your product.

[3]No—Some HP parts are not designed for customer self repair. In order to satisfy the customer warranty, HP requires that an authorized service provider replace the part. These parts are identified as "No" in the Illustrated Parts Catalog.

[1]Mandatory: Obligatoire—Pièces pour lesquelles la réparation par le client est obligatoire. Si vous demandez à HP de remplacer ces pièces, les coûts de déplacement et main d'œuvre du service vous seront facturés.

[2]Optional: Facultatif—Pièces pour lesquelles la réparation par le client est facultative. Ces pièces sont également conçues pour permettre au client d'effectuer lui-même la réparation. Toutefois, si vous demandez à HP de remplacer ces pièces, l'intervention peut ou non vous être facturée, selon le type de garantie applicable à votre produit.

[3]No: Non—Certaines pièces HP ne sont pas conçues pour permettre au client d'effectuer lui-même la réparation. Pour que la garantie puisse s'appliquer, HP exige que le remplacement de la pièce soit effectué par un Mainteneur Agréé. Ces pièces sont identifiées par la mention “Non” dans le Catalogue illustré.

[1]Mandatory: Obbligatorie—Parti che devono essere necessariamente riparate dal cliente. Se il cliente ne affida la riparazione ad HP, deve sostenere le spese di spedizione e di manodopera per il servizio.

[2]Optional: Opzionali—Parti la cui riparazione da parte del cliente è facoltativa. Si tratta comunque di componenti progettati per questo scopo. Se tuttavia il cliente ne richiede la sostituzione ad HP, potrebbe dover sostenere spese addizionali a seconda del tipo di garanzia previsto per il prodotto.

[3]No: Non CSR—Alcuni componenti HP non sono progettati per la riparazione da parte del cliente. Per rispettare la garanzia, HP richiede che queste parti siano sostituite da un centro di assistenza autorizzato. Tali parti sono identificate da un “No” nel Catalogo illustrato dei componenti.

[1]Mandatory: Zwingend—Teile, die im Rahmen des Customer Self Repair Programms ersetzt werden müssen. Wenn Sie diese Teile von HP ersetzen lassen, werden Ihnen die Versand- und Arbeitskosten für diesen Service berechnet.

[2]Optional: Optional—Teile, für die das Customer Self Repair-Verfahren optional ist. Diese Teile sind auch für Customer Self Repair ausgelegt. Wenn Sie jedoch den Austausch dieser Teile von HP vornehmen lassen möchten, können bei diesem Service je nach den für Ihr Produkt vorgesehenen Garantiebedingungen zusätzliche Kosten anfallen.

[3]No: Kein—Einige Teile sind nicht für Customer Self Repair ausgelegt. Um den Garantieanspruch des Kunden zu erfüllen, muss das Teil von einem HP Servicepartner ersetzt werden. Im illustrierten Teilekatalog sind diese Teile mit „No“ bzw. „Nein“ gekennzeichnet.

[1]Mandatory: Obligatorio—componentes para los que la reparación por parte del usuario es obligatoria. Si solicita a HP que realice la sustitución de estos componentes, tendrá que hacerse cargo de los gastos de desplazamiento y de mano de obra de dicho servicio.

[2]Optional: Opcional— componentes para los que la reparación por parte del usuario es opcional. Estos componentes también están diseñados para que puedan ser reparados por el usuario. Sin embargo, si precisa que HP realice su sustitución, puede o no conllevar costes adicionales, dependiendo del tipo de servicio de garantía correspondiente al producto.

[3]No: No—Algunos componentes no están diseñados para que puedan ser reparados por el usuario. Para que el usuario haga valer su garantía, HP pone como condición que un proveedor de servicios autorizado realice la sustitución de estos componentes. Dichos componentes se identifican con la palabra “No” en el catálogo ilustrado de componentes.

[1]Mandatory: Verplicht—Onderdelen waarvoor Customer Self Repair verplicht is. Als u HP verzoekt deze onderdelen te vervangen, komen de reiskosten en het arbeidsloon voor uw rekening.

[2]Optional: Optioneel—Onderdelen waarvoor reparatie door de klant optioneel is. Ook deze onderdelen zijn ontworpen voor reparatie door de klant. Als u echter HP verzoekt deze onderdelen voor u te vervangen, kunnen daarvoor extra kosten in rekening worden gebracht, afhankelijk van het type garantieservice voor het product.

[3]No: Nee—Sommige HP onderdelen zijn niet ontwikkeld voor reparatie door de klant. In verband met de garantievoorwaarden moet het onderdeel door een geautoriseerde Service Partner worden vervangen. Deze onderdelen worden in de geïllustreerde onderdelencatalogus aangemerkt met "Nee".

[1]Mandatory: Obrigatória—Peças cujo reparo feito pelo cliente é obrigatório. Se desejar que a HP substitua essas peças, serão cobradas as despesas de transporte e mão-de-obra do serviço.
[2]Optional: Opcional—Peças cujo reparo feito pelo cliente é opcional. Essas peças também são projetadas para o reparo feito pelo cliente. No entanto, se desejar que a HP as substitua, pode haver ou não a cobrança de taxa adicional, dependendo do tipo de serviço de garantia destinado ao produto.
[3]No: Nenhuma—Algumas peças da HP não são projetadas para o reparo feito pelo cliente. A fim de cumprir a garantia do cliente, a HP exige que um técnico autorizado substitua a peça. Essas peças estão identificadas com a marca “No” (Não), no catálogo de peças ilustrado.

[1]Mandatory：必須 - 顧客自己修理が必須の部品。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、その修理サービスに関する交通費および人件費がお客様に請求されます。

[2]Optional：任意 - 顧客自己修理が任意である部品。この部品も顧客自己修理用です。当該部品について、もしもお客様がHPに交換作業を依頼される場合には、お買い上げの製品に適用される保証サービス内容の範囲内においては、費用を負担していただくことなく保証サービスを受けることができます。

[3]No：除外 - HP製品の一部の部品は、顧客自己修理用ではありません。製品の保証を継続するためには、HPまたはHP正規保守代理店による交換作業が必須となります。部品カタログには、当該部品が顧客自己修理除外品である旨が記載されています。

[1]Mandatory: 强制性的 — 要求客户必须自行维修的部件。如果您请求 HP 更换这些部件，则必须为该服务支付差旅费和人工费用。

[2]Optional: 可选的 — 客户可以选择是否自行维修的部件。这些部件也是为客户自行维修设计的。不过，如果您要求 HP 为您更换这些部件，则根据为您的产品指定的保修服务类型，HP 可能收取或不再收取任何附加费用。

[3]No: 否 — 某些 HP 部件的设计并未考虑客户自行维修。为了满足客户保修的需要，HP 要求授权服务提供商更换相关部件。这些部件在部件图解目录中标记为“否”。

[1]Mandatory: 強制的 — 客戶自行維修所使用的零件是強制性的。如果您要求 HP 更換這些零件，HP 將會向您收取此服務所需的外出費用與勞動成本。

[2]Optional: 選購的 — 客戶自行維修所使用的零件是選購的。這些零件也設計用於客戶自行維修之用。不過，如果您要求 HP 為您更換，則可能需要也可能不需要負擔額外的費用，端視針對此產品指定的保固服務類型而定。

[3]No: 否 — 某些 HP 零件沒有消費者可自行維修的設計。為符合客戶保固，HP 需要授權的服務供應商更換零件。這些零件在圖示的零件目錄中，被標示為「否」。

[1] Mandatory: 필수 — 고객 셀프 수리가 의무 사항인 필수 부품. 사용자가 HP에 이 부품의 교체를 요청할 경우 이 서비스에 대한 출장비 및 작업비가 청구됩니다.

[2] Optional: 옵션 — 고객 셀프 수리가 선택 사항인 부품. 이 부품들도 고객 셀프 수리가 가능하도록 설계되었습니다. 하지만 사용자가 HP에 이 부품의 교체를 요청할 경우 사용자가 구입한 제품에 해당하는 보증 서비스 유형에 따라 추가 비용 없이 교체가 가능할 수 있습니다.

[3] No: No — 고객 셀프 수리가 불가능하도록 설계된 HP 부품. 이 부품들은 고객 셀프 수리가 불가능하도록 설계되었습니다. HP는 고객 보증을 만족시키기 위해 공인 서비스 제공업체를 통해 부품을 교체하도록 하고 있습니다.

Removal and replacement procedures

Required tools

You need the following items for some procedures:

- T-10/T-15 Torx screwdriver (included with the server)
- HP Insight Diagnostics software ("HP Insight Diagnostics" on page 60)

Safety considerations

Before performing service procedures, review all the safety information.

Preventing electrostatic discharge

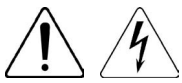
To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Symbols on equipment

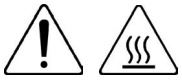
The following symbols may be placed on equipment to indicate the presence of potentially hazardous conditions.



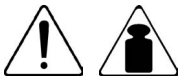
This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.
WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.

This symbol indicates the presence of electric shock hazards. The area contains no user or field serviceable parts. Do not open for any reason.
WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.

This symbol on an RJ-45 receptacle indicates a network interface connection.
WARNING: To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.



This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.
WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.



This symbol indicates that the component exceeds the recommended weight for one individual to handle safely.
WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

These symbols, on power supplies or systems, indicate that the equipment is supplied by multiple sources of power.
WARNING: To reduce the risk of injury from electric shock, remove all power cords to completely disconnect power from the system.

Server warnings and cautions

Before installing a server, be sure that you understand the following warnings and cautions.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Unplug the power cord from the power supply to disconnect power to the equipment.
- Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

CAUTION: Do not operate the server for long periods with the access panel open or removed. Operating the server in this manner results in improper airflow and improper cooling that can lead to thermal damage.

Preparation procedures

To access some components and perform certain service procedures, you must perform one or more of the following procedures:

- Power down the server (on page 25).
- Power up the server (on page 25).

- Unlock the front bezel (on page 26).
- Remove the front bezel (on page 26).

Power down the server

Before powering down the server for any upgrade or maintenance procedures, perform a backup of critical server data and programs.

IMPORTANT: When the server is in standby mode, auxiliary power is still being provided to the system.

To power down the server, use one of the following methods:

- Press and release the Power On/Standby button.

  This method initiates a controlled shutdown of applications and the OS before the server enters standby mode.
- Press and hold the Power On/Standby button for more than 4 seconds to force the server to enter standby mode.

  This method forces the server to enter standby mode without properly exiting applications and the OS. If an application stops responding, you can use this method to force a shutdown.
- Use a virtual power button selection through iLO.

  This method initiates a controlled remote shutdown of applications and the OS before the server enters standby mode.

Before proceeding, verify the server is in standby mode by observing that the system power LED is amber.

Power up the server

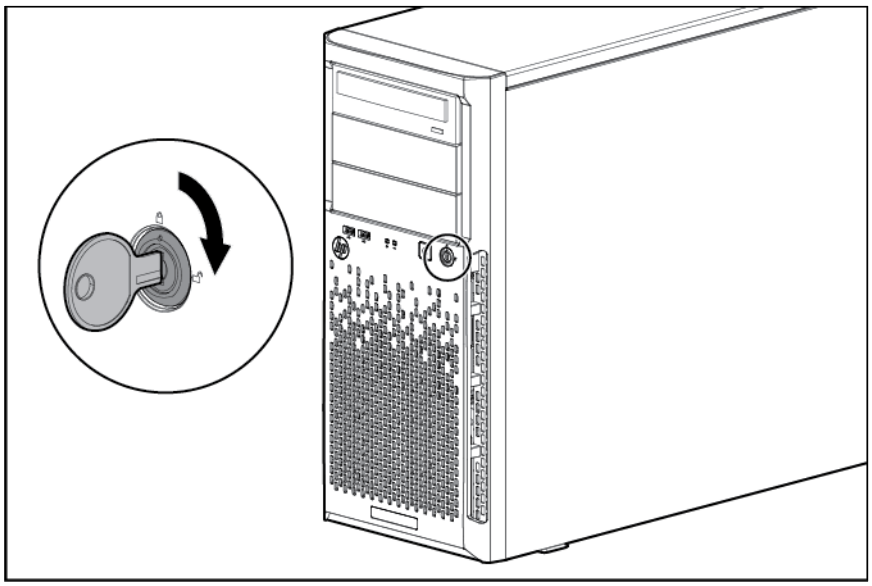
To power up the server:

1. Connect each power cord to the server.
2. Connect each power cord to the power source.
3. Press the Power On/Standby button.

   The server exits standby mode and applies full power to the system. The system power LED changes from amber to green.

Unlock the front bezel

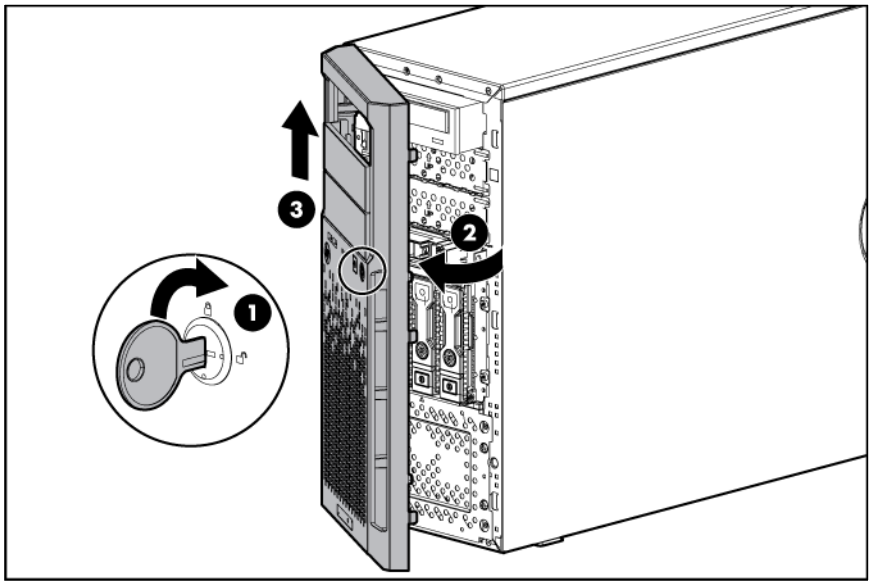
Using the key provided with the server, unlock the bezel with a clockwise turn.



Remove the front bezel

This server has a removable bezel that must be unlocked and opened before accessing the drives. The bezel must be kept closed during normal server operations.

To remove the component, unlock and remove the front bezel.



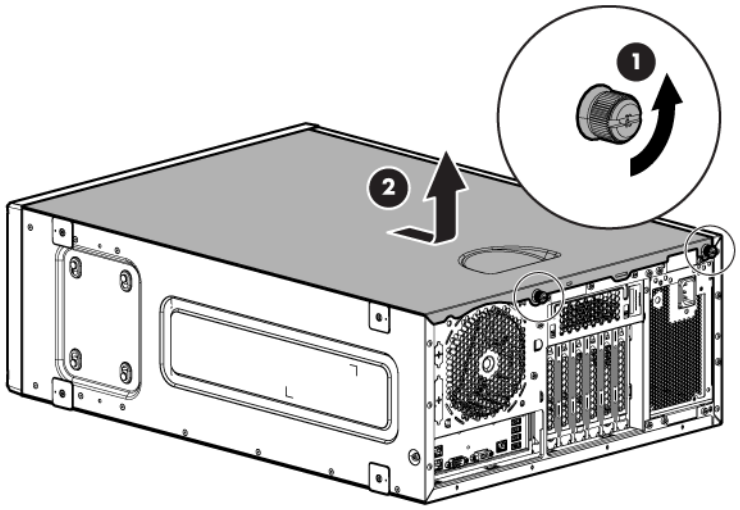
Access panel

To remove the component:

⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

⚠ **CAUTION:** For proper cooling do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed.

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Unlock the front bezel (on page 26).
4. Place the server on its side.
5. Remove the access panel:
   a. Loosen the access panel thumbscrews.
   b. Slide the access panel back.
   c. Lift the access panel away from the chassis.



To replace the component, reverse the removal procedure.

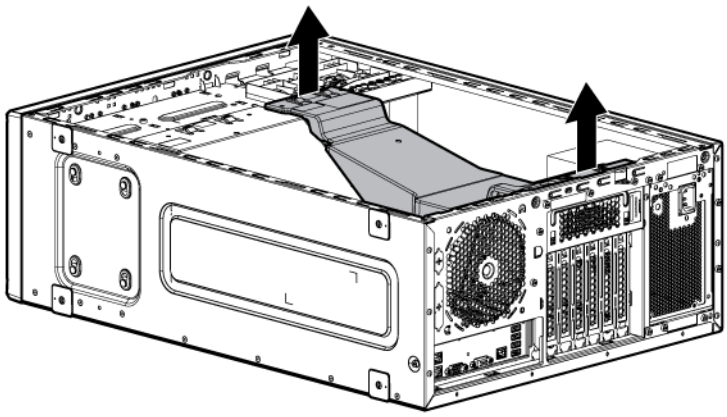
PCI air baffle

To remove the component:

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Unlock the front bezel (on page 26).
4. Place the server on its side.
5. Remove the access panel ("Access panel" on page 26).

CAUTION: For proper cooling do not operate the server without the access panel, baffles, expansion slot covers, or blanks installed.

6. Remove the PCI air baffle.

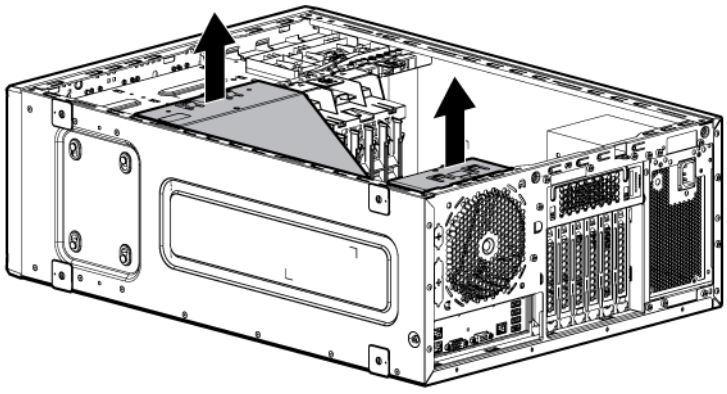


To replace the component, reverse the removal procedure.

System air baffle

To remove the component:

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Unlock the front bezel (on page 26).
4. Place the server on its side.
5. Remove the access panel ("Access panel" on page 26).
6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).
7. Remove the system air baffle.

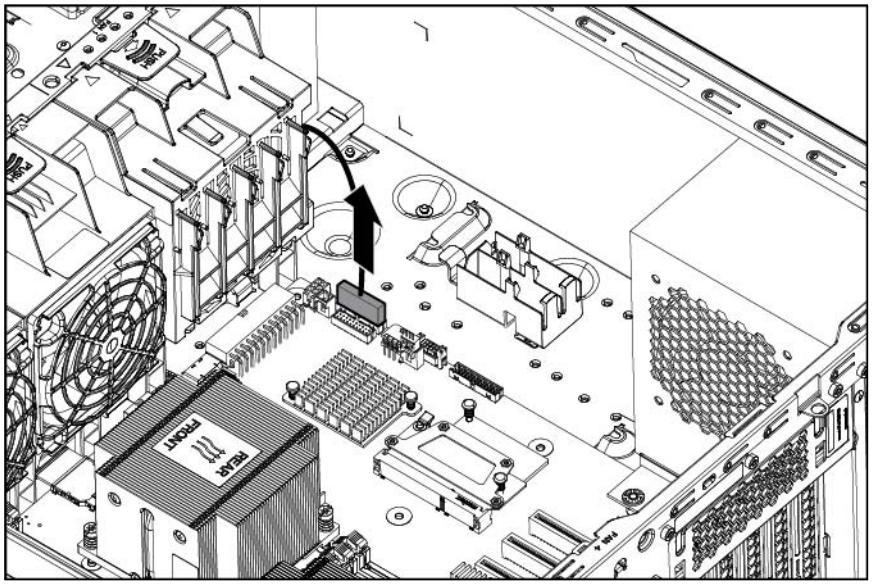


To replace the component, reverse the removal procedure.

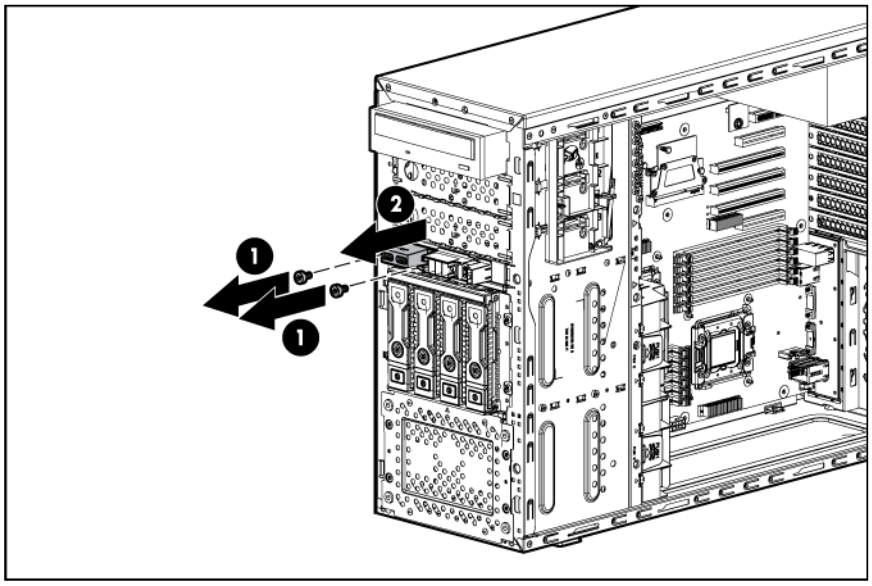
Front USB module

To remove the component:

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Remove the front bezel (on page 26).
4. Place the server on its side.
5. Remove the access panel ("Access panel" on page 26).
6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).
7. Remove the system air baffle ("System air baffle" on page 28).
8. Disconnect the front USB module cable from the system board.



9. Remove the front USB module.



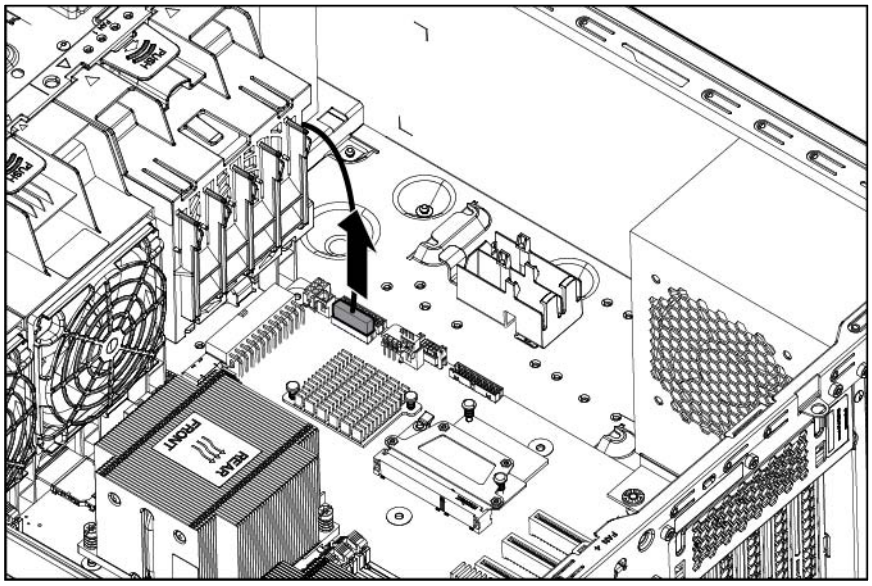
To replace the component, reverse the removal procedure.

Front panel LED/buttons module

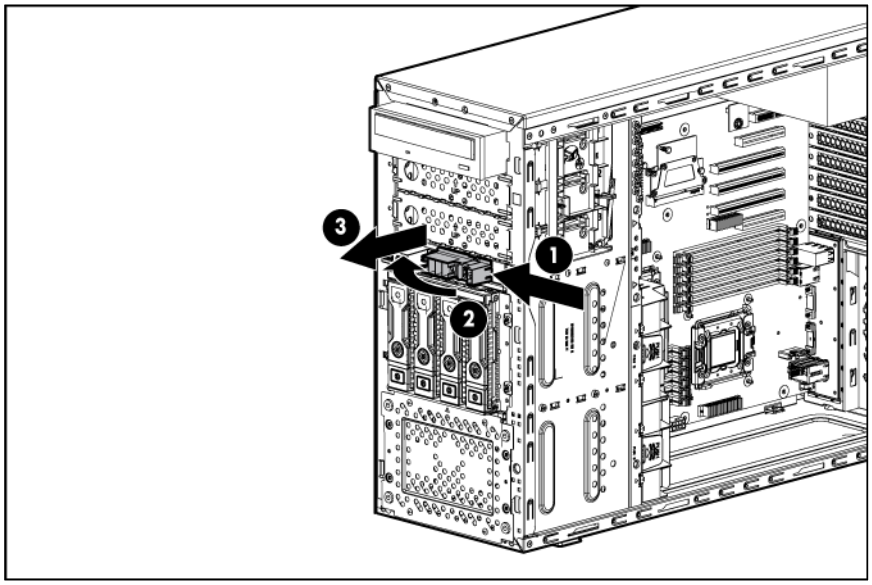
To remove the component:

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Remove the front bezel (on page 26).
4. Place the server on its side.
5. Remove the access panel ("Access panel" on page 26).
6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).
7. Remove the system air baffle ("System air baffle" on page 28).

8. Disconnect the front panel LED/buttons module cable from the system board.



9. Remove the front panel LED/buttons module.



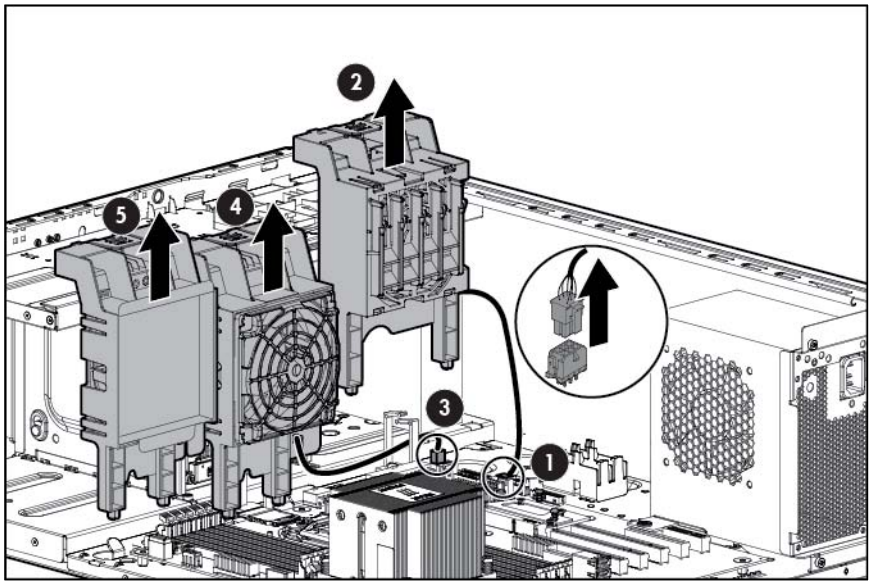
To replace the component, reverse the removal procedure.

Fan modules and fan blank

To remove the component:

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Unlock the front bezel (on page 26).
4. Place the server on its side.

5. Remove the access panel ("Access panel" on page 26).
6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).
7. Remove any installed full-length PCI expansion cards ("Full-length expansion board" on page 41).
8. Remove the system air baffle ("System air baffle" on page 28).
9. Remove the fan modules and the fan blank:
   a. Disconnect the fan 1 cable from the connector.
   b. Remove fan 1.
   c. Disconnect the fan 2 cable from the connector.
   d. Remove fan 2.
   e. Remove the fan blank.



To replace the component, reverse the removal procedure.

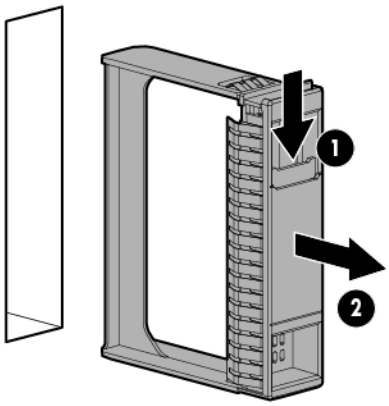
Hot-plug drive blank

CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

To remove the component:

1. Remove the front bezel (on page 26).

2. Remove the drive blank.



To replace the LFF drive blank, slide the component into the bay until it clicks.

To replace the SFF drive blank, while pressing the release latch, slide the component into the bay until it is fully seated.

Storage drive

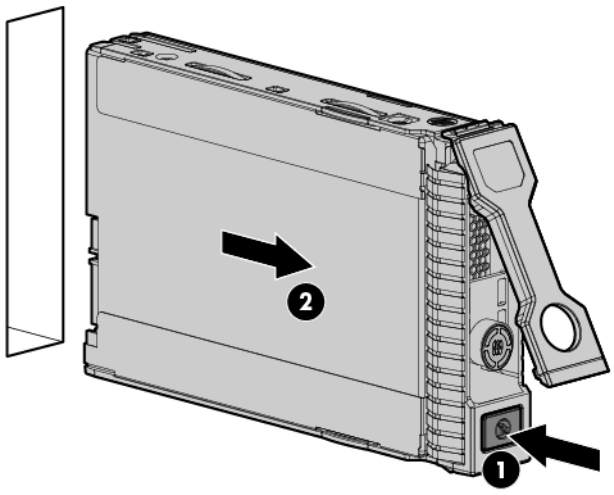
Hot-plug drive

> **CAUTION:** To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

To remove the component:

1. Back up all server data on the drive.
2. Determine the status of the drive from the drive LED definitions ("Hot-plug drive LED definitions" on page 75).
3. Remove the front bezel (on page 26).

4. Remove the drive.



To replace the component, reverse the removal procedure.

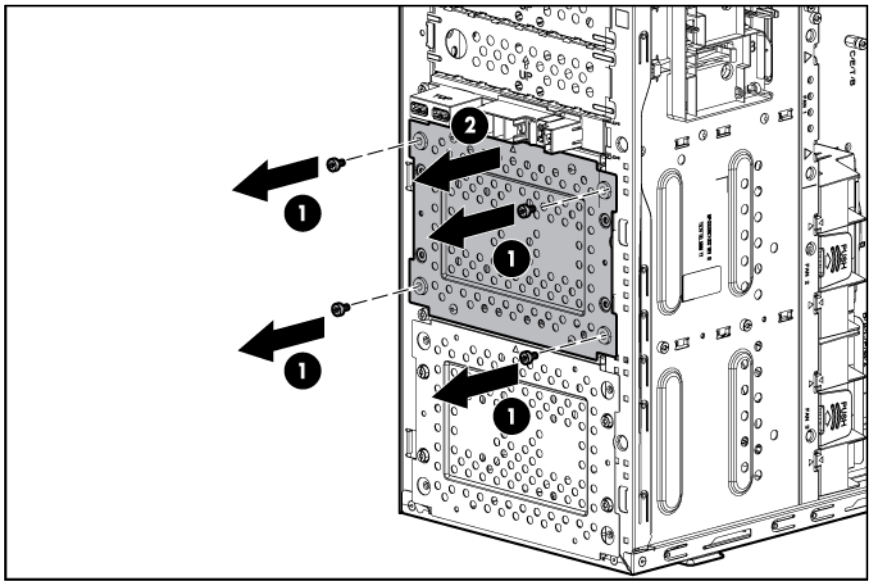
Non-hot-plug drive

CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

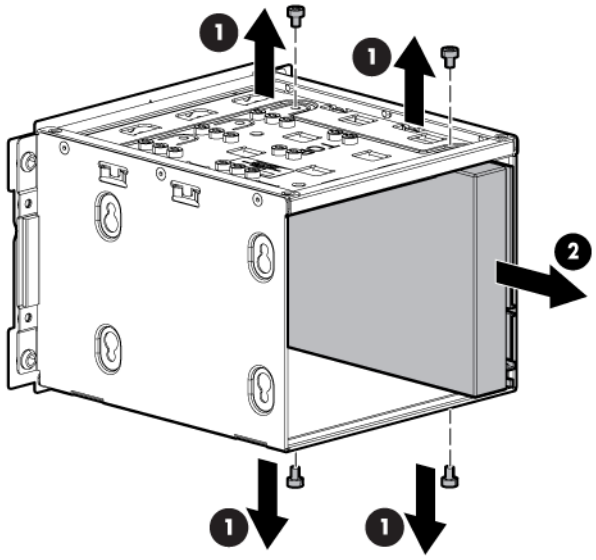
To remove the component:

1. Back up all server data on the drive.
2. Power down the server (on page 25).
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Remove the front bezel (on page 26).
5. Place the server on its side.
6. Remove the access panel ("Access panel" on page 26).
7. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).
8. Remove the system air baffle ("System air baffle" on page 28).
9. Remove any installed full-length PCI cards ("Full-length expansion board" on page 41).
10. Remove the fan modules and the fan blank ("Fan modules and fan blank" on page 31).
11. Remove the cables from the non-hot-plug drives.

12. Remove the non-hot-plug drive cage from chassis.



13. Remove the non-hot-plug drive.



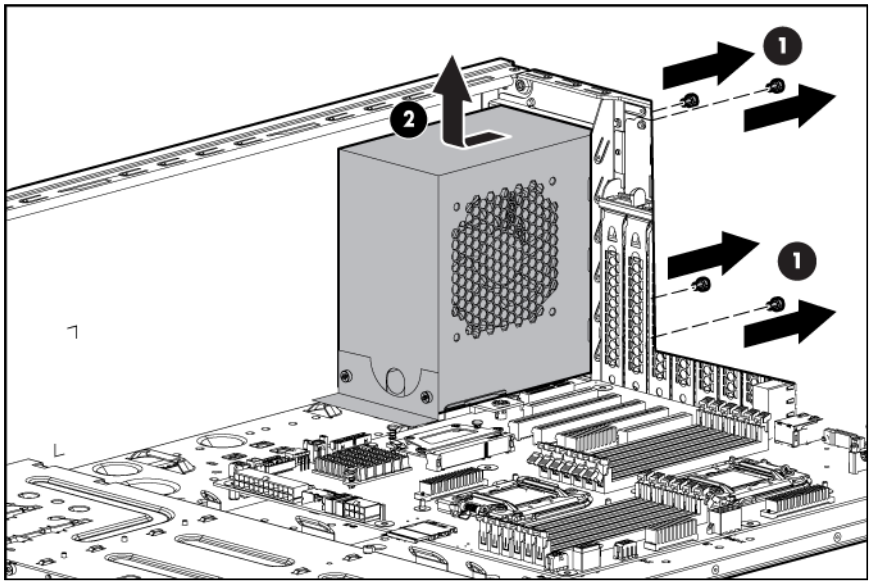
To replace the component, reverse the removal procedure.

Integrated power supply

To remove the component:

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Unlock the front bezel (on page 26).
4. Place the server on its side.

5. Remove the access panel ("Access panel" on page 26).
6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).
7. Remove the system air baffle ("System air baffle" on page 28).
8. Remove any installed full-length PCI cards ("Full-length expansion board" on page 41).
9. Remove the fan modules and the fan blank ("Fan modules and fan blank" on page 31).
10. Disconnect the power cables from the system board, drive cages, and optical drive.
11. Remove the power supply.



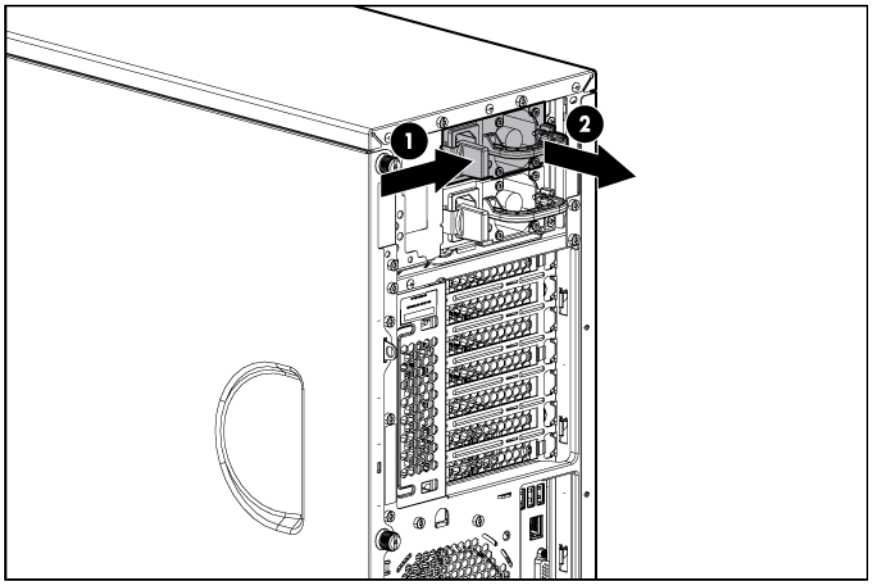
To replace the component, reverse the removal procedure.

Power supply modules

To remove the component:

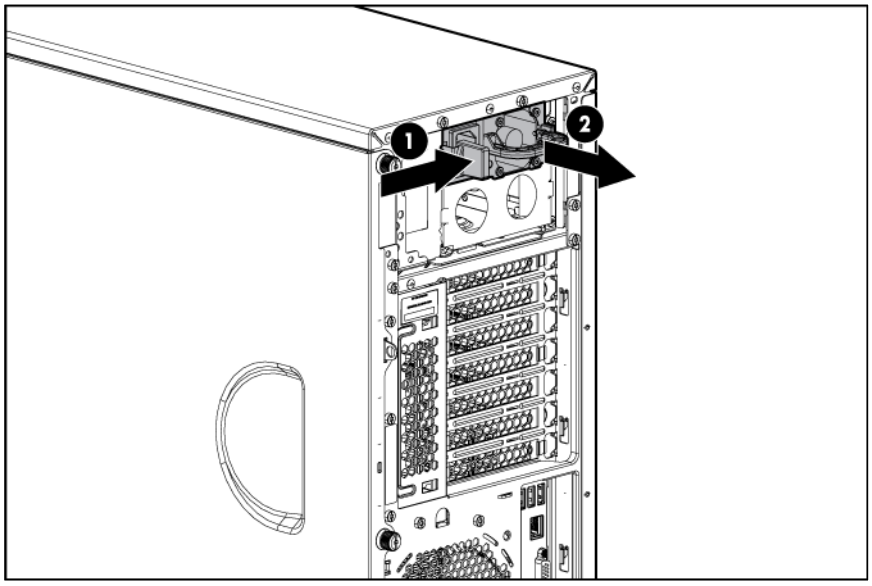
In a redundant power supply configuration:

Remove the power supply module.



In a nonredundant configuration:

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Remove the power supply module.



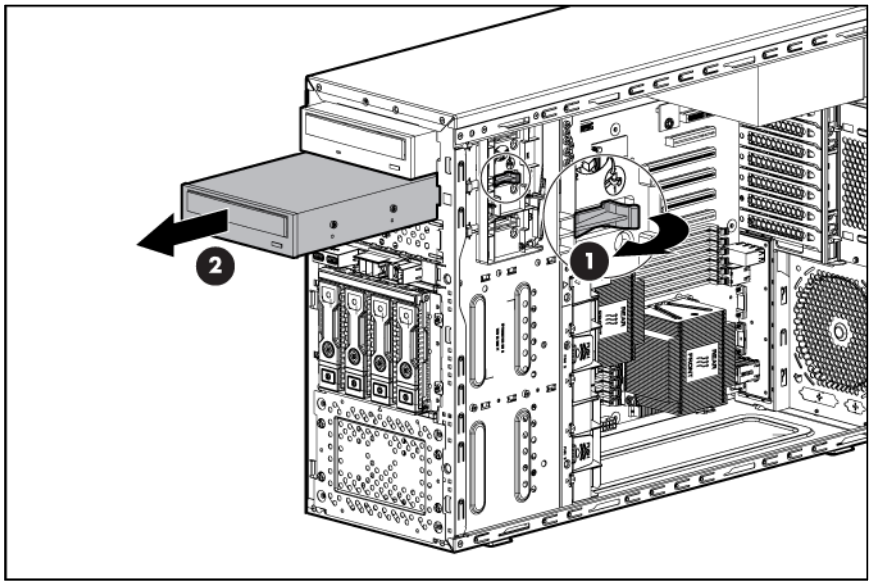
To replace the component, reverse the removal procedure.

Optical drive

To remove the component:

1. Power down the server (on page 25).

2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Remove the front bezel (on page 26).
4. Place the server on its side.
5. Remove the access panel ("Access panel" on page 26).
6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).
7. Remove the system air baffle ("System air baffle" on page 28).
8. Remove any installed full-length PCI cards ("Full-length expansion board" on page 41).
9. If installed, remove the RPS rear blank.
10. Remove fan 1 ("Fan modules and fan blank" on page 31).
11. Disconnect and remove the optical drive power and data cables.
12. Remove the optical drive.



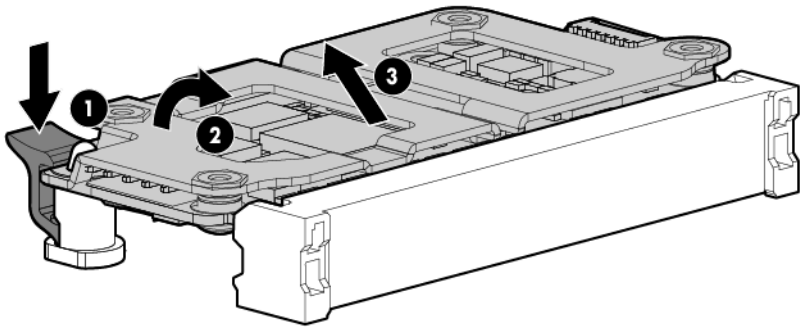
To replace the component, reverse the removal procedure.

Cache module for onboard controller (B120i)

To remove the component:

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Unlock the front bezel (on page 26).
4. Place the server on its side.
5. Remove the access panel ("Access panel" on page 26).
6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).

7. Remove any PCI cards installed in PCI slots 3, 4, 5, and 6 ("Full-length expansion board" on page 41).
8. Disconnect the capacitor pack cable from the module.
9. Remove the FBWC module from the cache module connector on the system board.



To replace the component, reverse the removal procedure.

FBWC capacitor pack

△ **CAUTION:** The cache module connector does not use the industry-standard DDR3 mini-DIMMs. Do not use the controller with cache modules designed for other controller models, because the controller can malfunction and you can lose data. Also, do not transfer this cache module to an unsupported controller model, because you can lose data.

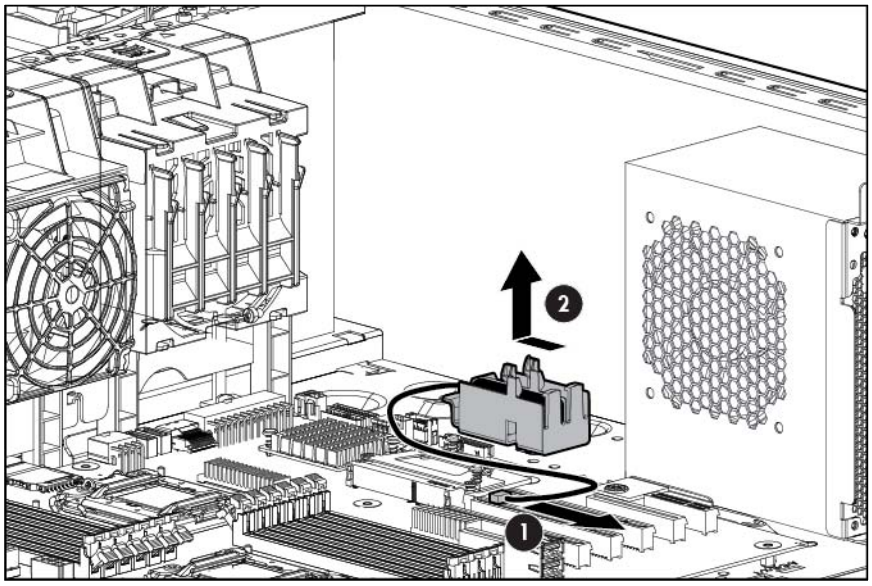
To remove the component:

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Unlock the front bezel (on page 26).
4. Place the server on its side.
5. Remove the access panel ("Access panel" on page 26).

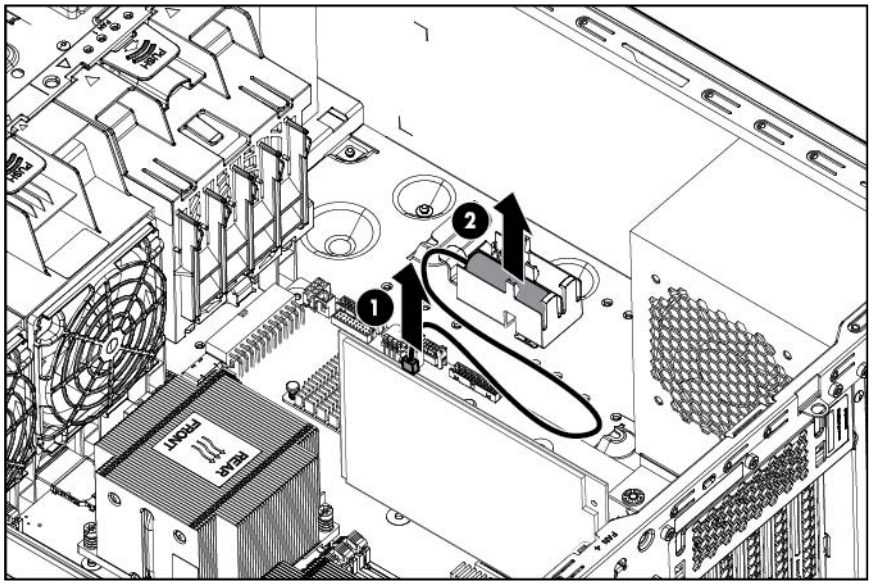
△ **CAUTION:** In systems that use external data storage, be sure that the server is the first unit to be powered down and the last to be powered back up. Taking this precaution ensures that the system does not erroneously mark the drives as failed when the server is powered up.

6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).
7. Disconnect the capacitor pack cable from the cache module.
8. Remove the capacitor pack from the holder:

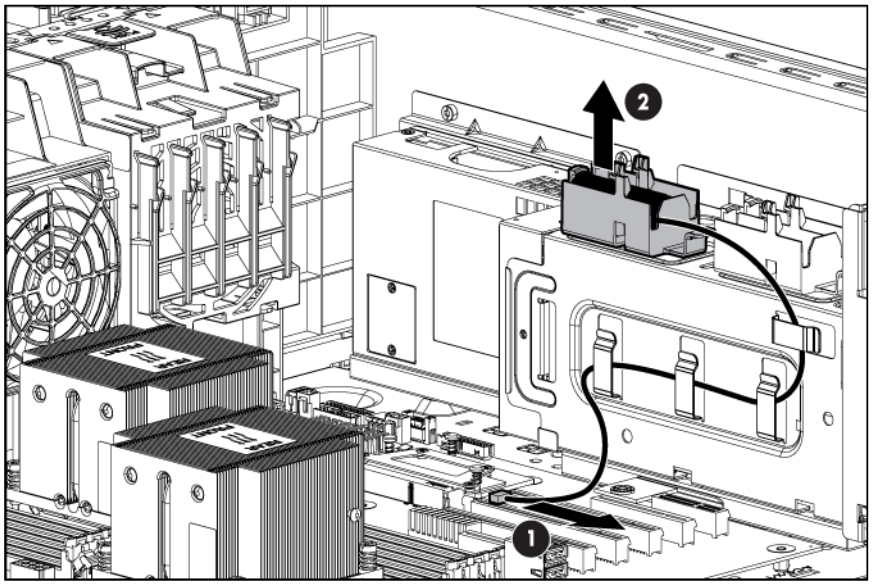
- For an integrated power supply configuration



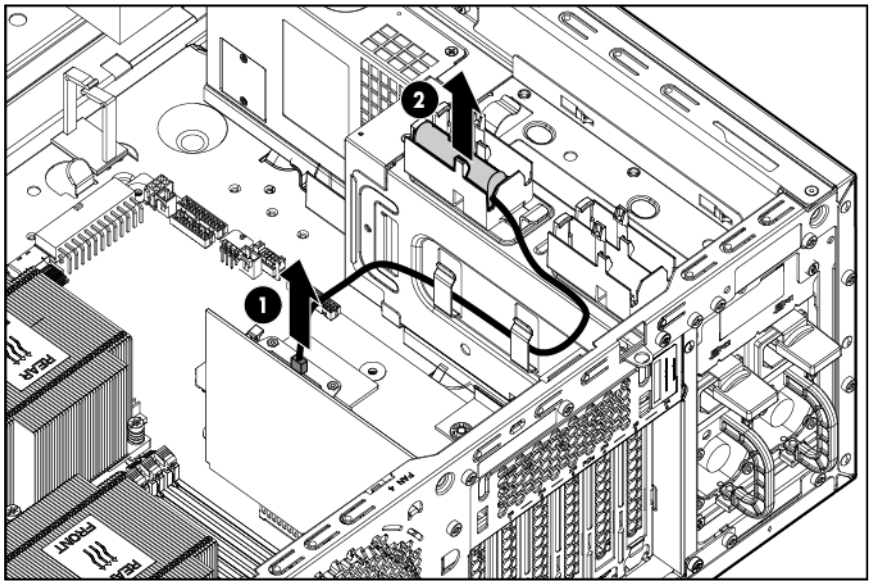
- For an integrated power supply configuration showing Smart Array controller card installed



- For a redundant power supply configuration



- For a redundant power supply configuration showing Smart Array controller card installed



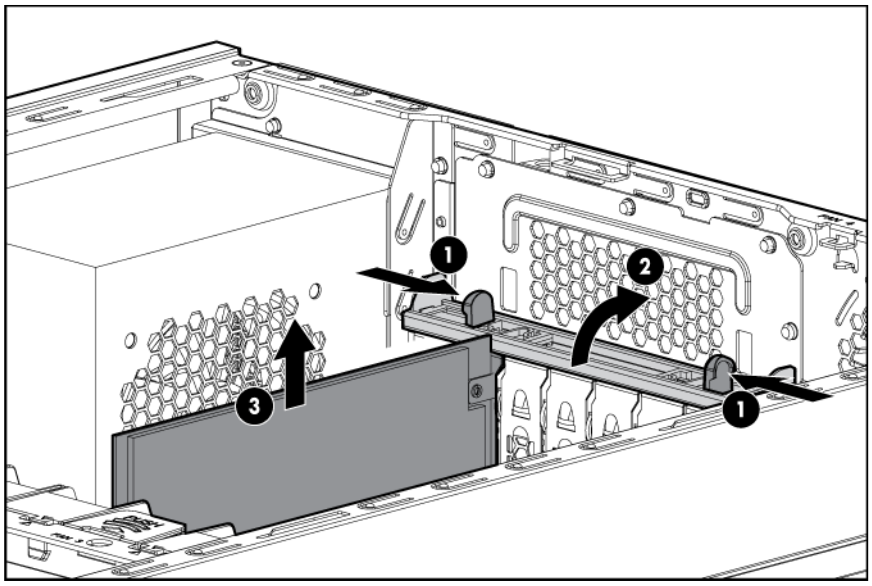
To replace the component, reverse the removal procedure.

Full-length expansion board

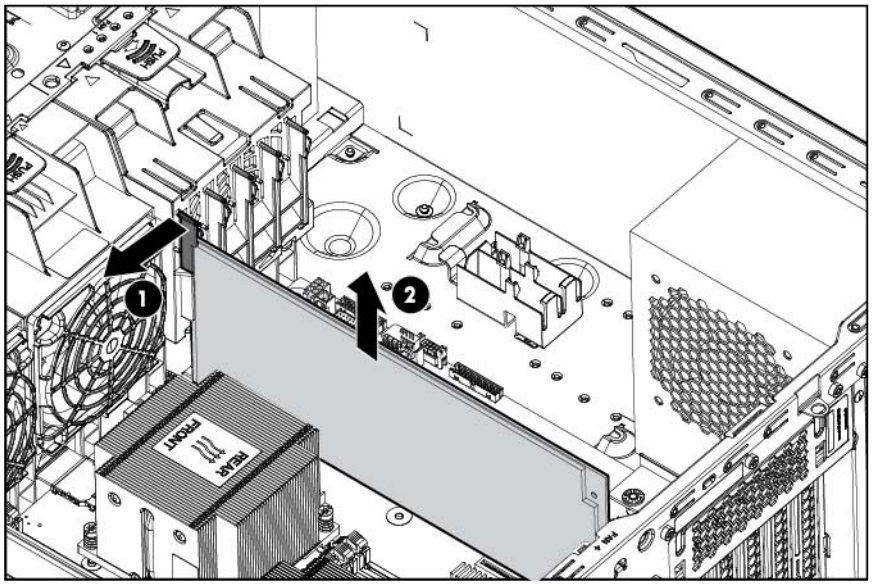
To remove the component:

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Unlock the front bezel (on page 26).
4. Place the server on its side.

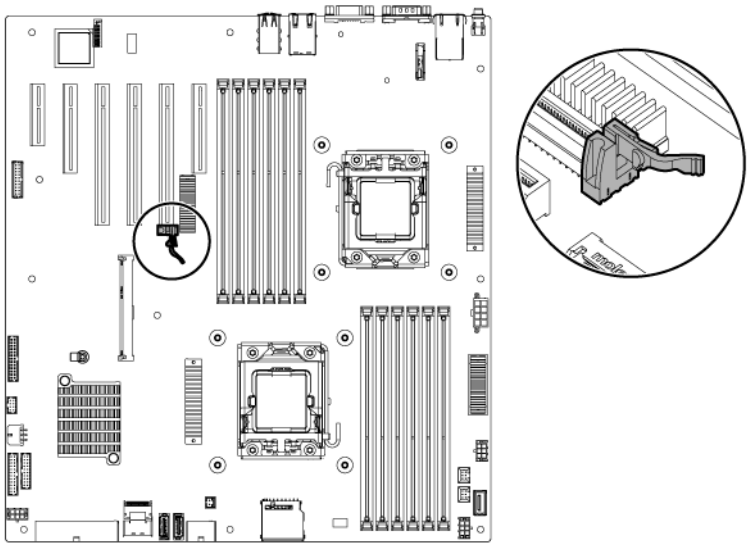
5. Remove the access panel ("Access panel" on page 26).
6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).
7. Open the PCI slot cover retaining bracket.
8. Release the expansion board retaining bracket and remove the expansion board.



9. If a full-length expansion board is installed on the fan holder, remove the expansion board.



IMPORTANT: If removing an expansion board from PCI slot 2, release the retainer latch on the system board, and then remove the expansion board from the system.



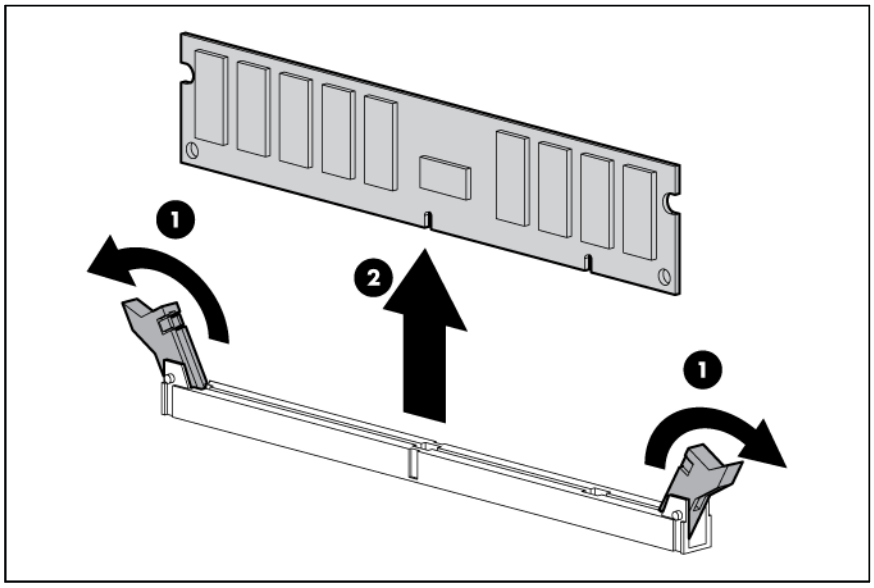
To replace the component, reverse the removal procedure.

DIMMs

To remove the component:

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Unlock the front bezel (on page 26).
4. Place the server on its side.
5. Remove the access panel ("Access panel" on page 26).
6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).
7. Remove the system air baffle ("System air baffle" on page 28).
8. Open the DIMM slot latches.

9. Remove the DIMM.



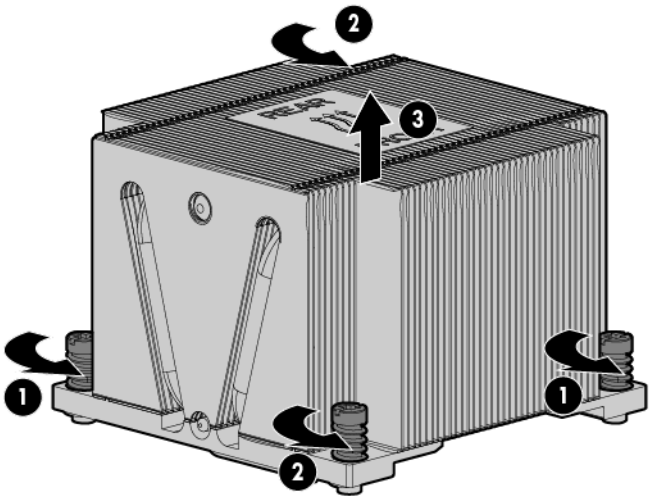
To replace the component, reverse the removal procedure.

Heatsink

To remove the component:

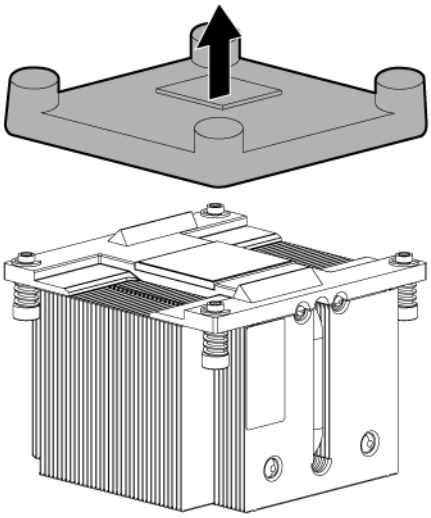
1. Power down the server (on page 25).
2. Unlock the front bezel (on page 26).
3. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
4. Place the server on its side.
5. Remove the access panel ("Access panel" on page 26).
6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).
7. Remove the system air baffle ("System air baffle" on page 28).
8. Remove the heatsink:
   a. Loosen one pair of diagonally opposite screws halfway, and then loosen the other pair of screws.
   b. Completely loosen all screws in the same sequence.

c. Remove the heatsink from the processor backplate.



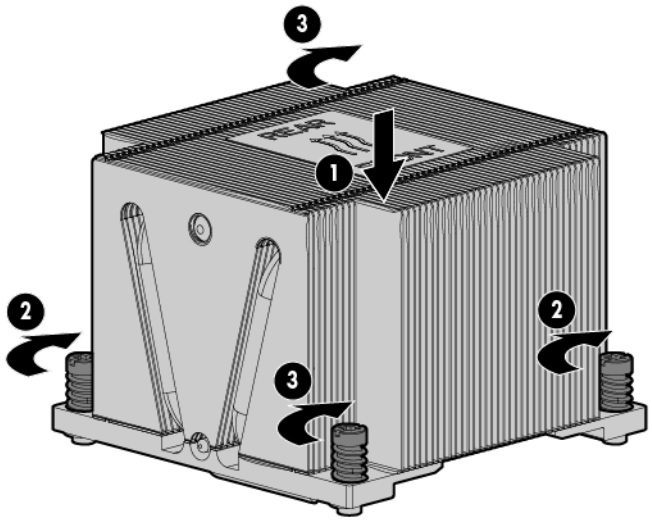
To replace the component:

1. Clean the old thermal grease from the processor with the alcohol swab. Allow the alcohol to evaporate before continuing.
2. Remove the thermal interface protective cover from the heatsink.



3. Install the heatsink:
   a. Position the heatsink using the guide pin on the processor backplate.
   b. Tighten one pair of diagonally opposite screws halfway, and then tighten the other pair of screws.

c. Finish the installation by completely tightening the screws in the same sequence.



4. Install the system air baffle.
5. If removed, install the PCI air baffle.
6. Install the access panel.
7. Return the server to an upright position.
8. Lock the front bezel.
9. Connect each power cord to the server.
10. Connect each power cord to the power source.
11. Power up the server (on page 25).

Processor

CAUTION: To avoid damage to the processor:
- Handle the processor only by the edges.
- Do not touch the bottom of the processor, especially the contact area.

IMPORTANT: If installing a processor with a faster speed, update the system ROM before installing the processor.

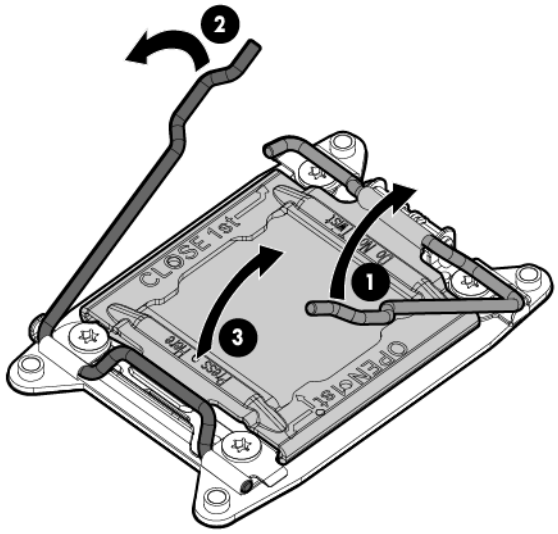
To remove the component:

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Unlock the front bezel (on page 26).
4. Place the server on its side.
5. Remove the access panel ("Access panel" on page 26).
6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).

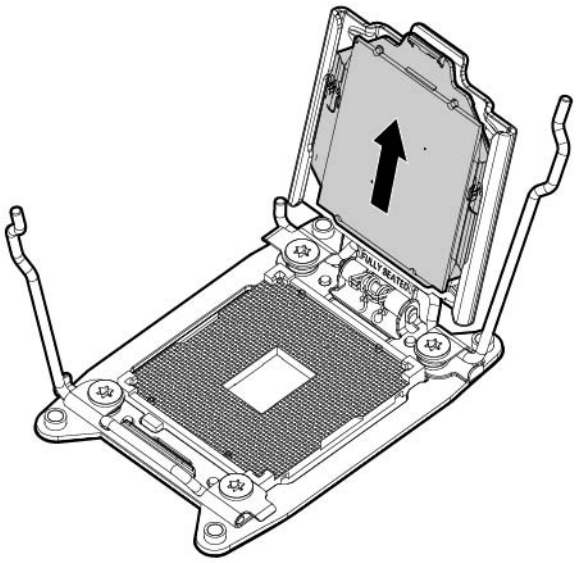
7. Remove the system air baffle ("System air baffle" on page 28).
8. Remove the heatsink ("Heatsink" on page 44).

> **CAUTION:** Failure to completely open the processor locking lever prevents the processor from seating during installation, leading to hardware damage.

9. Open each of the processor locking levers in the order indicated, and then open the processor retaining bracket.



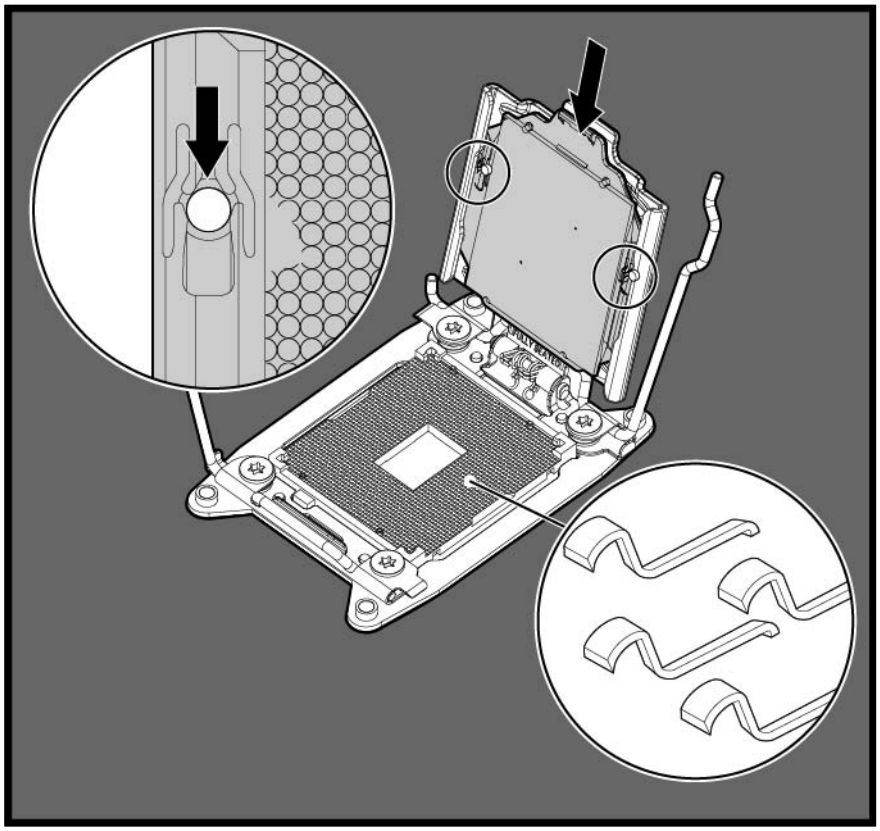
10. Remove the processor from the processor retaining bracket.



> **CAUTION:** To avoid damage to the processor, do not touch the bottom of the processor, especially the contact area.

To replace the component:

1. Install the processor. Verify that the processor is fully seated in the processor retaining bracket by visually inspecting the processor installation guides on either side of the processor. **THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED**.

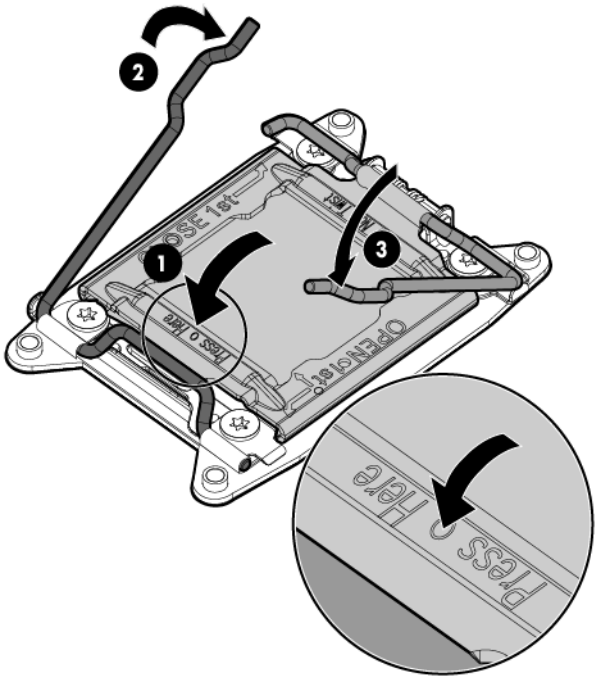


△ **CAUTION: THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED.** To avoid damage to the system board, do not touch the processor or the processor socket contacts.

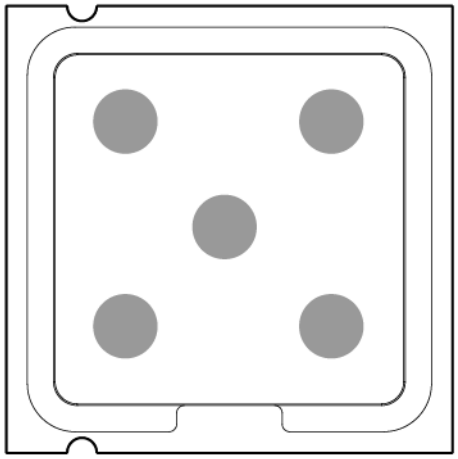
2. Close the processor retaining bracket. When the processor is installed properly inside the processor retaining bracket, the processor retaining bracket clears the flange on the front of the socket.

△ **CAUTION:** Do not press down on the processor. Pressing down on the processor may cause damage to the processor socket and the system board. Press only in the area indicated on the processor retaining bracket.

3. Press and hold the processor retaining bracket in place, and then close each processor locking lever. Press only in the area indicated on the processor retaining bracket.



4. Clean the old thermal grease from the bottom of the heatsink with the alcohol swab. Allow the alcohol to evaporate before continuing.
5. Apply all the grease to the top of the processor in the following pattern to ensure even distribution.



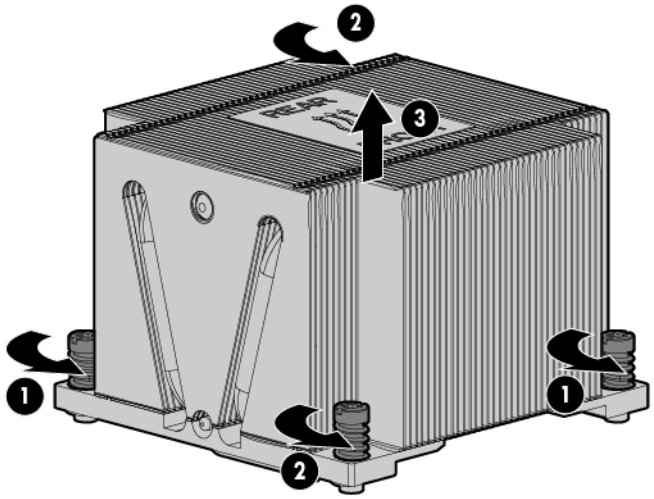
6. Install the heatsink ("Heatsink" on page 44).
7. Install the system air baffle.
8. If removed, install the PCI air baffle.
9. Install the access panel.
10. Return the server to an upright position.
11. Lock the front bezel.
12. Connect each power cord to the server.

13. Connect each power cord to the power source.
14. Power up the server (on page 25).

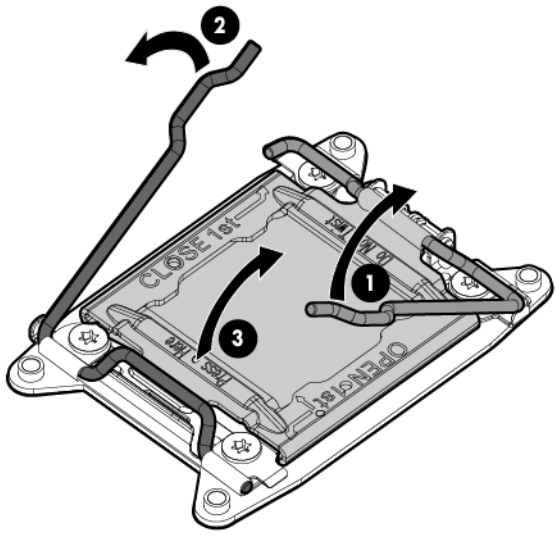
System board

To remove the component:

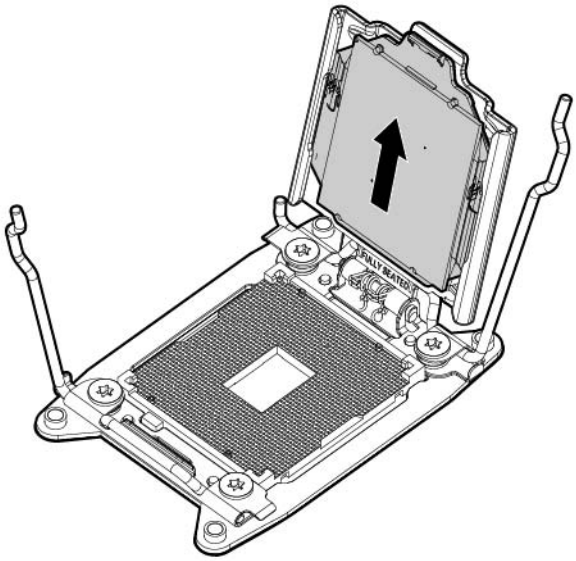
1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Unlock the front bezel (on page 26).
4. Place the server on its side.
5. Remove the access panel ("Access panel" on page 26).
6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).
7. Remove the system air baffle ("System air baffle" on page 28).
8. If installed, disconnect the FBWC capacitor pack cable from the cache module ("FBWC capacitor pack" on page 39).
9. Remove the expansion boards ("Full-length expansion board" on page 41).
10. Remove all DIMMs.
11. Remove the fan modules and the fan blank ("Fan modules and fan blank" on page 31).
12. Disconnect all cables connected to the system board.
13. Remove the heatsink:
    a. Loosen one pair of diagonally opposite screws halfway, and then loosen the other pair of screws.
    b. Completely loosen all screws in the same sequence.
    c. Remove the heatsink from the processor backplate.



14. Open each of the processor locking levers in the order indicated, and then open the processor retaining bracket.



15. Remove the processor from the processor retaining bracket.



△ **CAUTION:** To avoid damage to the processor, do not touch the bottom of the processor, especially the contact area.

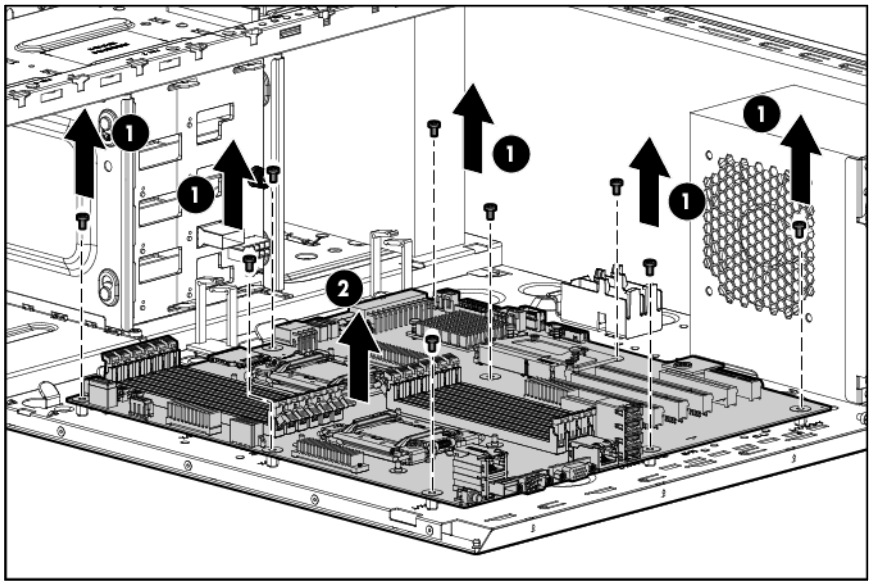
△ **CAUTION:** To avoid damage to the system board:

- Do not touch the processor socket contacts.
- Always install the processor socket cover after removing the processor from the socket.
- Do not tilt or slide the processor when lowering the processor into the socket.

△ **CAUTION:** Removal of the processor or heatsink renders the thermal layer between the processor and heatsink useless. Clean the component with the provided alcohol swab, then add thermal grease.

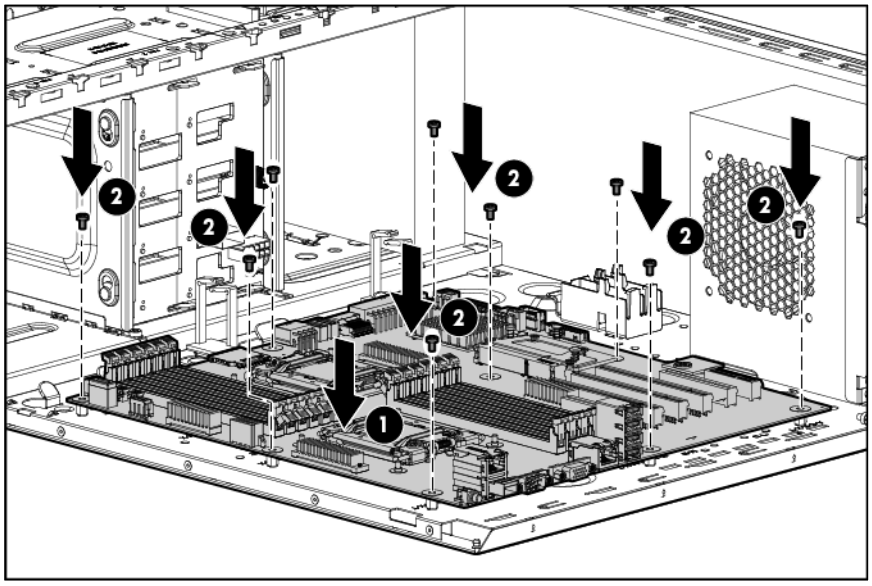
16. Place the processor on a static-dissipating work surface or inside an anti-static bag.

17. Remove the system board.

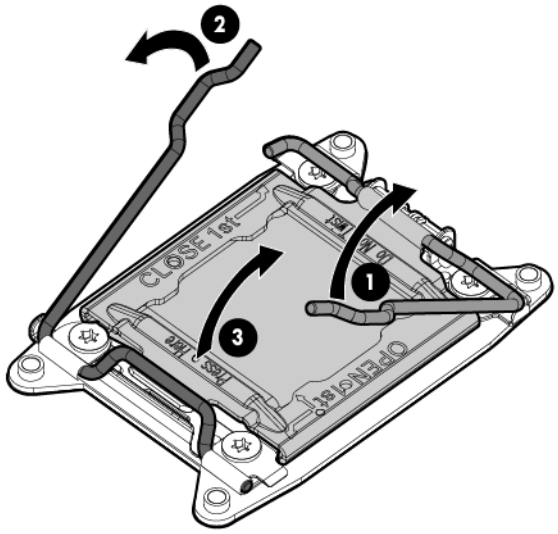


To replace the component:

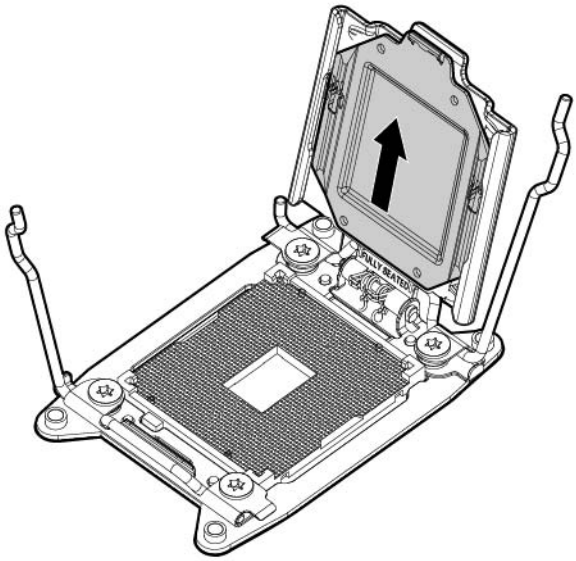
1. Install the spare system board.



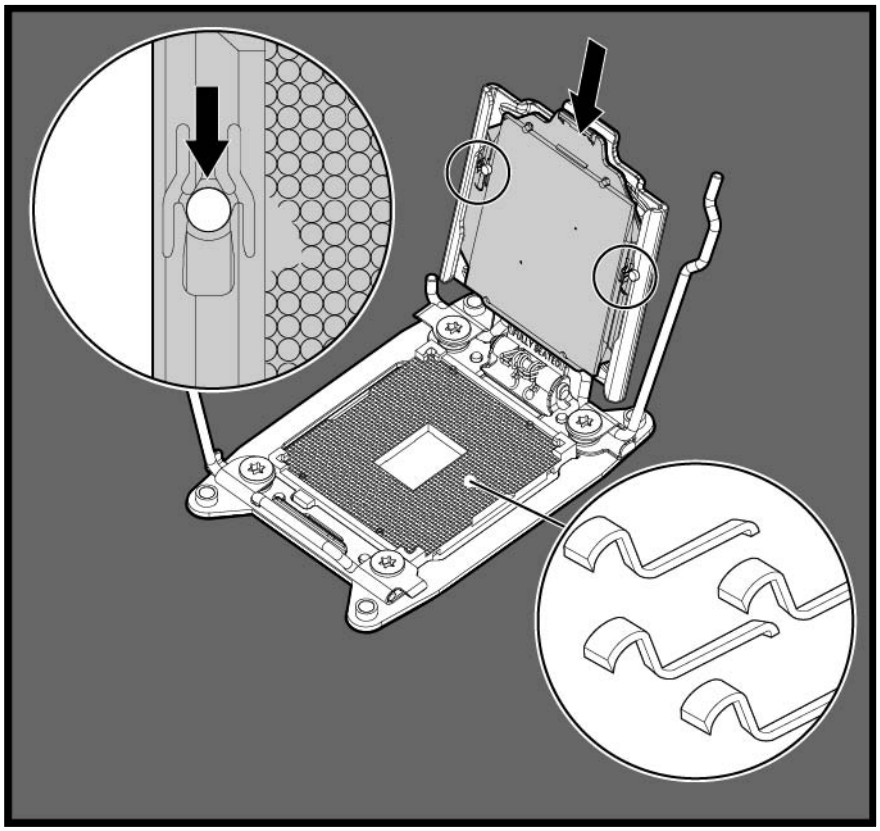
2. Open each of the processor locking levers in the order indicated, and then open the processor retaining bracket.



3. Remove the clear processor socket cover. Retain the processor socket cover for future use.



4. Install the processor. Verify that the processor is fully seated in the processor retaining bracket by visually inspecting the processor installation guides on either side of the processor. **THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED.**

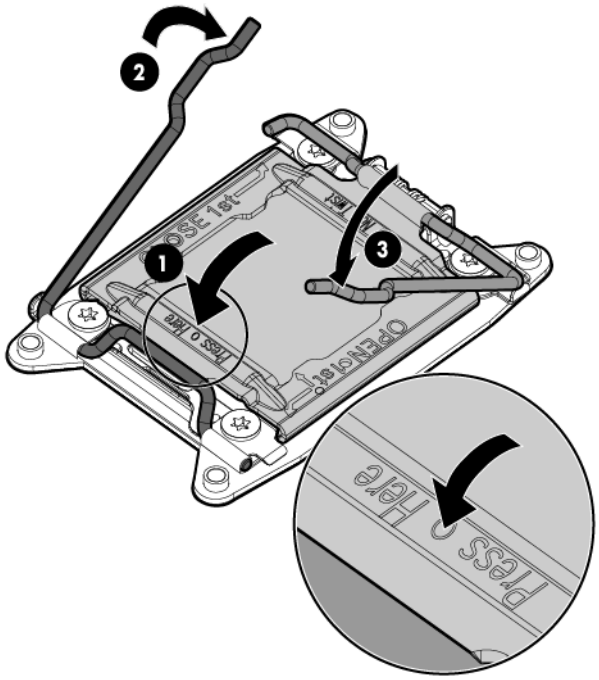


△ **CAUTION: THE PINS ON THE SYSTEM BOARD ARE VERY FRAGILE AND EASILY DAMAGED.** To avoid damage to the system board, do not touch the processor or the processor socket contacts.

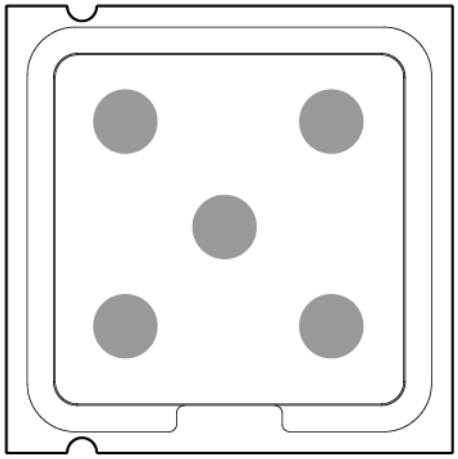
5. Close the processor retaining bracket. When the processor is installed properly inside the processor retaining bracket, the processor retaining bracket clears the flange on the front of the socket.

△ **CAUTION:** Do not press down on the processor. Pressing down on the processor may cause damage to the processor socket and the system board. Press only in the area indicated on the processor retaining bracket.

6. Press and hold the processor retaining bracket in place, and then close each processor locking lever. Press only in the area indicated on the processor retaining bracket.

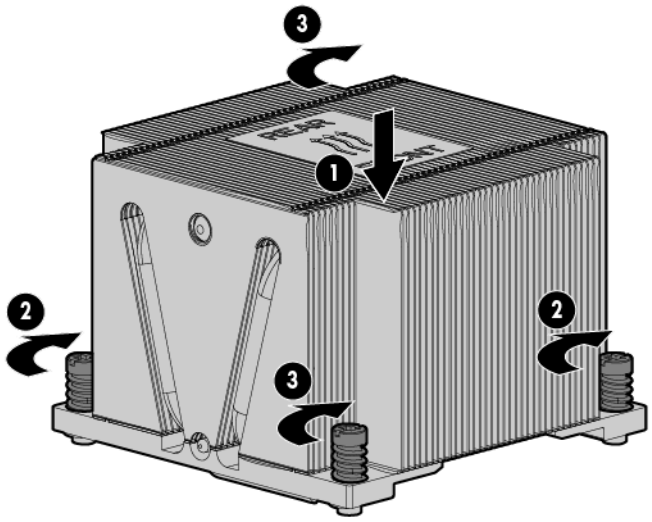


7. Install the processor socket cover onto the processor socket of the failed system board.
8. Clean the old thermal grease from the heatsink and the top of the processor with the alcohol swab. Allow the alcohol to evaporate before continuing.
9. Apply all the grease to the top of the processor in the following pattern to ensure even distribution.



10. Install the heatsink:
    a. Position the heatsink on the processor backplate.
    b. Tighten one pair of diagonally opposite screws halfway, and then tighten the other pair of screws.

c. Finish the installation by completely tightening the screws in the same sequence.



IMPORTANT: Install all components with the same configuration that was used on the failed system board.

11. Connect all cables removed from the failed system board.
12. Install fans 2 and 3.
13. Install fan 1.
14. Install all DIMMs.
15. Install the expansion boards.
16. If removed, connect the FBWC capacitor pack cable to the cache module.
17. Install the system air baffle.
18. If removed, install the PCI air baffle.
19. Install the access panel.
20. Return the server to an upright position.
21. Lock the front bezel.
22. Connect each power cord to the server.
23. Connect each power cord to the power source.
24. Power up the server (on page 25).

IMPORTANT: Install all components with the same configuration that was used on the failed system board.

After you replace the system board, you must re-enter the server serial number and the product ID.

1. During the server startup sequence, press the **F9** key to access RBSU.
2. Select the **Advanced Options** menu.
3. Select **Service Options**.
4. Select **Serial Number**. The following warnings appear:

```
WARNING! WARNING! WARNING! The serial number is loaded into the system during
the manufacturing process and should NOT be modified. This option should only
```

```
be used by qualified service personnel. This value should always match the
serial number sticker located on the chassis.
Warning: The serial number should ONLY be modified by qualified personnel.
This value should always match the serial number located on the chassis.
```

5. Press the **Enter** key to clear the warning.
6. Enter the serial number and press the **Enter** key.
7. Select **Product ID**. The following warning appears:

```
Warning: The Product ID should ONLY be modified by qualified personnel. This
value should always match the Product ID on the chassis.
```

8. Enter the product ID and press the **Enter** key.
9. Press the **Esc** key to close the menu.
10. Press the **Esc** key to exit RBSU.
11. Press the **F10** key to confirm exiting RBSU. The server automatically reboots.

System battery

If the server no longer automatically displays the correct date and time, then replace the battery that provides power to the real-time clock. Under normal use, battery life is 5 to 10 years.

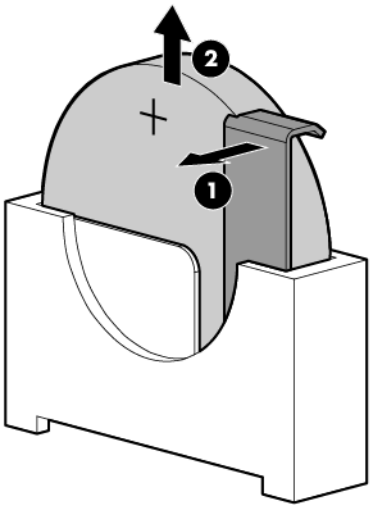
⚠ **WARNING:** The computer contains an internal lithium manganese dioxide, a vanadium pentoxide, or an alkaline battery pack. A risk of fire and burns exists if the battery pack is not properly handled. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose the battery to temperatures higher than 60°C (140°F).
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
- Replace only with the spare designated for this product.

To remove the component:

1. Power down the server (on page 25).
2. Remove all power:
   a. Disconnect each power cord from the power source.
   b. Disconnect each power cord from the server.
3. Unlock the front bezel (on page 26).
4. Place the server on its side.
5. Remove the access panel ("Access panel" on page 26).
6. If installed, remove the PCI air baffle ("PCI air baffle" on page 27).
7. Remove the system air baffle ("System air baffle" on page 28).

8. Remove the battery.



To replace the component, reverse the removal procedure.

For more information about battery replacement or proper disposal, contact an authorized reseller or an authorized service provider.

HP Trusted Platform Module

The TPM is not a customer-removable part.

△ **CAUTION:** Any attempt to remove an installed TPM from the system board breaks or disfigures the TPM security rivet. Upon locating a broken or disfigured rivet on an installed TPM, administrators should consider the system compromised and take appropriate measures to ensure the integrity of the system data.

If you suspect a TPM board failure, leave the TPM installed and remove the system board. Contact an HP authorized service provider for a replacement system board and TPM board.

Troubleshooting

Troubleshooting resources

The *HP ProLiant Gen8 Troubleshooting Guide, Volume I: Troubleshooting* provides procedures for resolving common problems and comprehensive courses of action for fault isolation and identification, issue resolution, and software maintenance on ProLiant servers and server blades. To view the guide, select a language:

- English (http://www.hp.com/support/ProLiant_TSG_v1_en)
- French (http://www.hp.com/support/ProLiant_TSG_v1_fr)
- Spanish (http://www.hp.com/support/ProLiant_TSG_v1_sp)
- German (http://www.hp.com/support/ProLiant_TSG_v1_gr)
- Japanese (http://www.hp.com/support/ProLiant_TSG_v1_jp)
- Simplified Chinese (http://www.hp.com/support/ProLiant_TSG_v1_sc)

The *HP ProLiant Gen8 Troubleshooting Guide, Volume II: Error Messages* provides a list of error messages and information to assist with interpreting and resolving error messages on ProLiant servers and server blades. To view the guide, select a language:

- English (http://www.hp.com/support/ProLiant_EMG_v1_en)
- French (http://www.hp.com/support/ProLiant_EMG_v1_fr)
- Spanish (http://www.hp.com/support/ProLiant_EMG_v1_sp)
- German (http://www.hp.com/support/ProLiant_EMG_v1_gr)
- Japanese (http://www.hp.com/support/ProLiant_EMG_v1_jp)
- Simplified Chinese (http://www.hp.com/support/ProLiant_EMG_v1_sc)

Diagnostic tools

HP ROM-Based Setup Utility

RBSU is a configuration utility embedded in HP ProLiant servers that performs a wide range of configuration activities that can include the following:

- Configuring system devices and installed options
- Enabling and disabling system features
- Displaying system information
- Selecting the primary boot controller
- Configuring memory options
- Language selection

For more information on RBSU, see the *HP ROM-Based Setup Utility User Guide* on the HP RBSU Information Library (http://www.hp.com/go/rbsu/docs).

HP Insight Diagnostics

HP Insight Diagnostics is a proactive server management tool, available in both offline and online versions, that provides diagnostics and troubleshooting capabilities to assist IT administrators who verify server installations, troubleshoot problems, and perform repair validation.

HP Insight Diagnostics Offline Edition performs various in-depth system and component testing while the OS is not running. To run this utility, boot the server using Intelligent Provisioning.

HP Insight Diagnostics Online Edition is a web-based application that captures system configuration and other related data needed for effective server management. Available in Microsoft Windows and Linux versions, the utility helps to ensure proper system operation.

For more information or to download the utility, see the HP website (http://www.hp.com/servers/diags). HP Insight Diagnostics Online Edition is also available in the SPP. For more information, see the HP website (http://www.hp.com/go/spp/download).

HP Insight Diagnostics survey functionality

HP Insight Diagnostics (on page 60) provides survey functionality that gathers critical hardware and software information on ProLiant servers.

This functionality supports operating systems that are supported by the server. For operating systems supported by the server, see the HP website (http://www.hp.com/go/supportos).

If a significant change occurs between data-gathering intervals, the survey function marks the previous information and overwrites the survey data files to reflect the latest changes in the configuration.

Survey functionality is installed with every Intelligent Provisioning-assisted HP Insight Diagnostics installation, or it can be installed through the SPP.

Integrated Management Log

The IML records hundreds of events and stores them in an easy-to-view form. The IML timestamps each event with 1-minute granularity.

You can view recorded events in the IML in several ways, including the following:

- From within HP SIM
- From within operating system-specific IML viewers
  - For Windows: IML Viewer
  - For Linux: IML Viewer Application
- From within the iLO user interface
- From within HP Insight Diagnostics (on page 60)

USB support

HP provides both standard USB 2.0 support and legacy USB 2.0 support. Standard support is provided by the OS through the appropriate USB device drivers. Before the OS loads, HP provides support for USB devices through legacy USB support, which is enabled by default in the system ROM.

Legacy USB support provides USB functionality in environments where USB support is not available normally. Specifically, HP provides legacy USB functionality for the following:

- POST
- RBSU
- Diagnostics
- DOS
- Operating environments which do not provide native USB support

Automatic Server Recovery

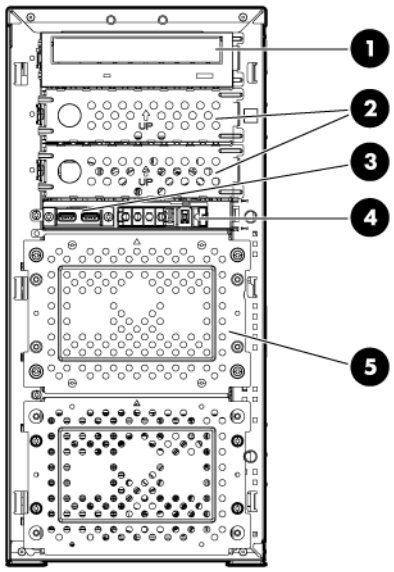
ASR is a feature that causes the system to restart when a catastrophic operating system error occurs, such as a blue screen, ABEND (does not apply to HP ProLiant DL980 Servers), or panic. A system fail-safe timer, the ASR timer, starts when the System Management driver, also known as the Health Driver, is loaded. When the operating system is functioning properly, the system periodically resets the timer. However, when the operating system fails, the timer expires and restarts the server.

ASR increases server availability by restarting the server within a specified time after a system hang. At the same time, the HP SIM console notifies you by sending a message to a designated pager number that ASR has restarted the system. You can disable ASR from the System Management Homepage or through RBSU.

Component identification

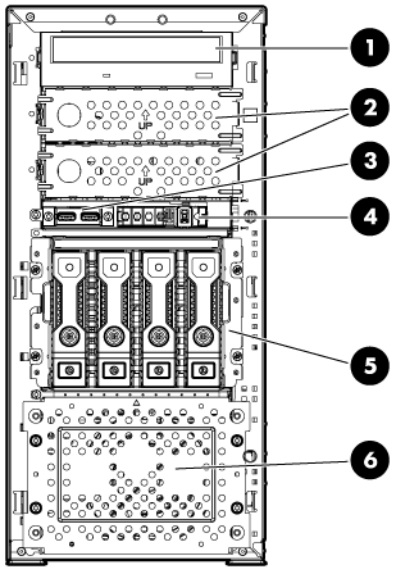
Front panel components

- Non-hot-plug drive configuration



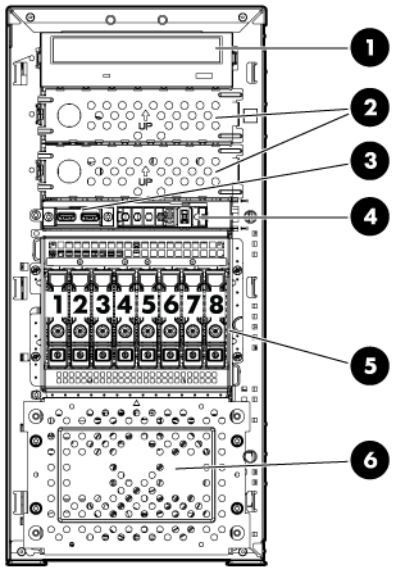
Item	Description
1	Optical drive
2	Optional media bay (2)
3	USB 2.0 connectors (2)
4	Thermal sensor
5	LFF drives (4)

- Four-bay LFF drive configuration



Item	Description
1	Optical drive
2	Optional media bay (2)
3	USB 2.0 connectors (2)
4	Thermal sensor
5	LFF drives (4)
6	Optional drive bay

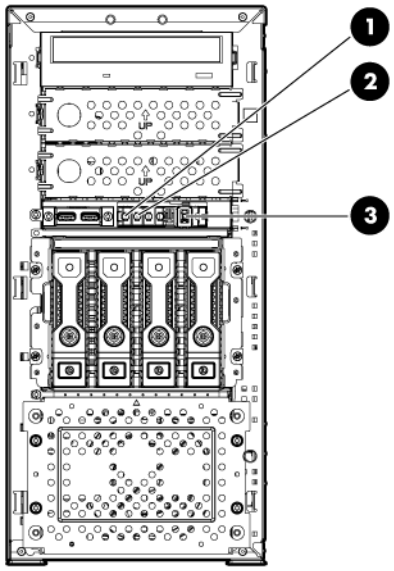
- Eight-bay SFF drive configuration



Item	Description
1	Optical drive
2	Optional media bay (2)
3	USB 2.0 connectors (2)

Item	Description
4	Thermal sensor
5	SFF drives (8)
6	Optional drive bay

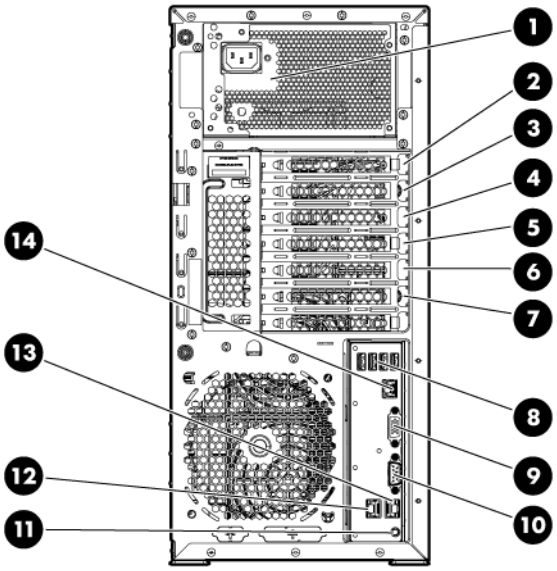
Front panel LEDs and buttons



Item	Description	Status
1	Health LED	Solid green = Normal Flashing amber = System degraded Flashing red (1 Hz/cycle per sec) = System critical Fast-flashing red (4 Hz/cycles per sec) = Power fault*
2	NIC status LED	Solid green = Link to network Flashing green (1 Hz/cycle per sec) = Network active Off = No network activity
3	Power On/Standby button and system power LED	Solid green = System on Flashing green (1 Hz/cycle per sec) = Performing power on sequence Solid amber = System in standby Off = No power present**

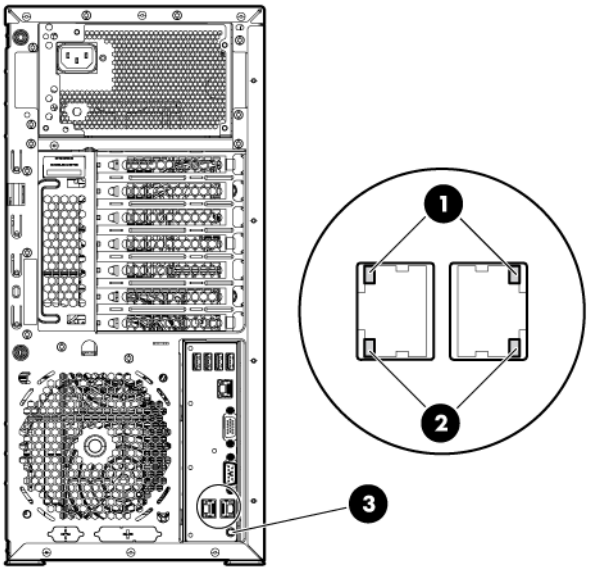
* To identify components in a degraded or critical state, see the Systems Insight Display LEDs, check iLO/BIOS logs, and reference the server troubleshooting guide.
** Facility power is not present, power cord is not attached, no power supplies are installed, power supply failure has occurred, or the power button cable is disconnected.

Rear panel components



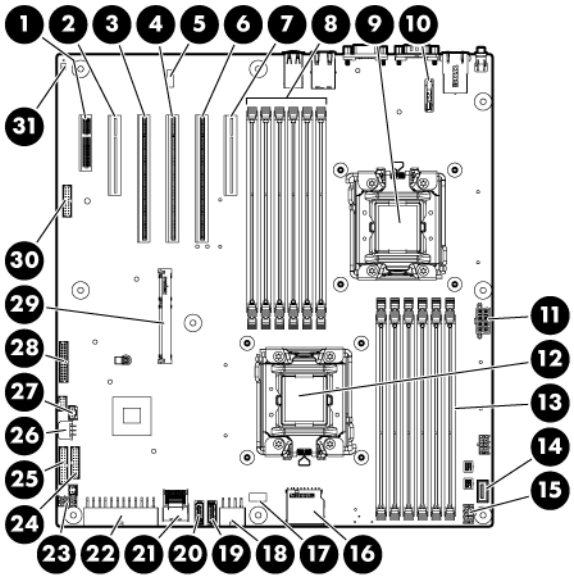
Item	Description
1	Integrated power supply
2	Slot 6 PCIe2 x4(1) for processor 1
3	Slot 5 PCIe2 x8(4,1) for processor 1
4	Slot 4 PCIe3 x16(8,4,1) for processor 2
5	Slot 3 PCIe3 x16(16,8,4,1) for processor 2
6	Slot 2 PCIe3x16 (16,8,4,1) for processor 1
7	Slot 1 PCIe3 x8 (4,1) for processor 1
8	USB 2.0 connectors (4)
9	Video connector
10	Serial connector
11	UID/LED button
12	NIC connector 2
13	NIC connector 1
14	iLO connector

Rear panel LEDs



Item	Description	Status
1	NIC activity LED	Green = Network activity Flashing green = Network activity Off = No network activity
2	NIC link LED	Green = Network link Off = No network link
3	UID LED button	Blue = Activated Flashing blue = System is being managed remotely Off = Deactivated

System board components



Item	Description
1	Slot 6 PCIe2 x4 (1)
2	Slot 5 PCIe2 x8 (4,1)
3	Slot 4 PCIe3 x16 (8,4,1)
4	Slot 3 PCIe3 x16 (16,8,4,1)
5	System maintenance switch
6	Slot 2 PCIe3 x16 (16,8,4,1)
7	Slot 1 PCIe3 x8 (4,1)
8	Processor 2 DIMM slots
9	Processor socket 2
10	System battery
11	Processor 2 power connector
12	Processor socket 1 (populated)
13	Processor 1 DIMM slots
14	Internal USB connector
15	Fan connector 3
16	SD card connector
17	Internal USB tape drive connector
18	Processor 1 power connector
19	SATA connector 2
20	SATA connector 1
21	Mini-SAS connector
22	System board power connector
23	Fan connector 2
24	Front panel connector
25	Front panel connector
26	Fan connector 1
27	Ambient temperature sensor connector
28	Redundant power supply connector
29	Cache module connector
30	TPM connector
31	NMI header

System maintenance switch

The system maintenance switch (SW2) is a twelve-position switch that is used for system configuration.

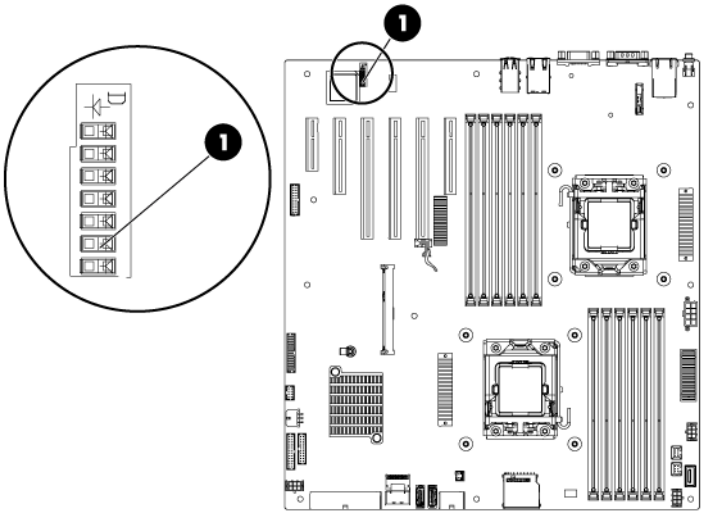
Position	Description	Function
S1	iLO security override	Off = No function. On = Override enabled.
S2	Configuration lock	Off = System configuration can be changed. On = System configuration is locked.
S5	Password disable	Off = Power-on password enabled. On = Power-on password disabled.

Position	Description	Function
S6	Reset configuration	Off = No function On = ROM reads the system configuration as invalid.
S3, S4, S7-S12	—	Reserved

When the system maintenance switch position 6 is set to the On position, the system is prepared to erase all system configuration settings from both CMOS and NVRAM.

△ **CAUTION:** Clearing CMOS and/or NVRAM deletes configuration information. Be sure to properly configure the server or data loss could occur.

System board LEDs



Item	LED description	Status
1	System power good	Green = System power good Off = System power not ready

NMI functionality

An NMI crash dump creates a crash dump log before resetting a system which is not responding.

Crash dump log analysis is an essential part of diagnosing reliability problems, such as failures of operating systems, device drivers, and applications. Many crashes freeze a system, and the only available action for administrators is to restart the system. Resetting the system erases any information which could support problem analysis, but the NMI feature preserves that information by performing a memory dump before a system reset.

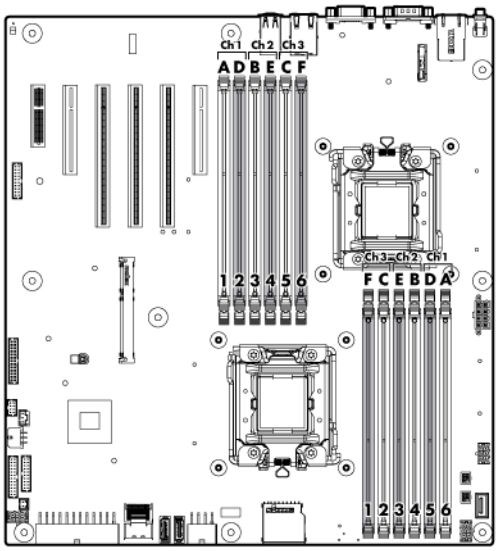
To force the system to invoke the NMI handler and generate a crash dump log, do one of the following:

- Use the iLO Virtual NMI feature.
- Short the NMI header.

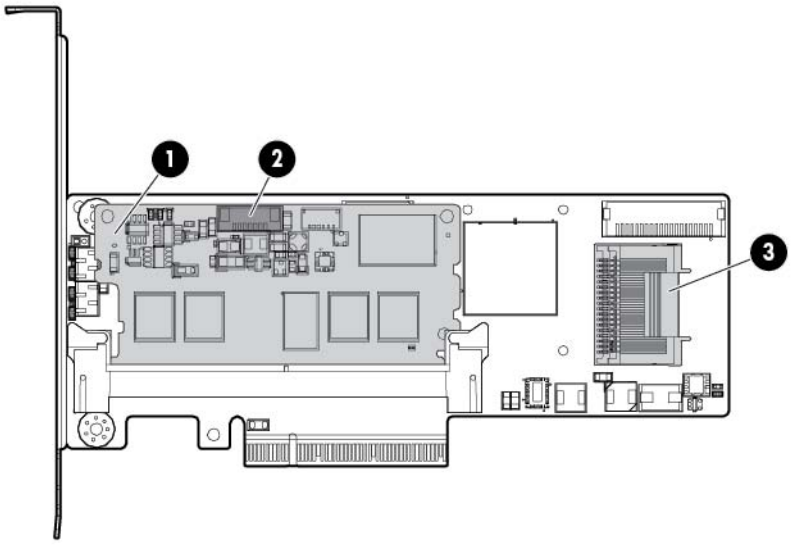
For more information, see the HP website (http://www.hp.com/support/NMI).

DIMM slot locations

DIMM slots are numbered sequentially (1 through 6) for each processor. The supported AMP modes use the letter assignments for population guidelines.



Smart Array SAS RAID controller card components



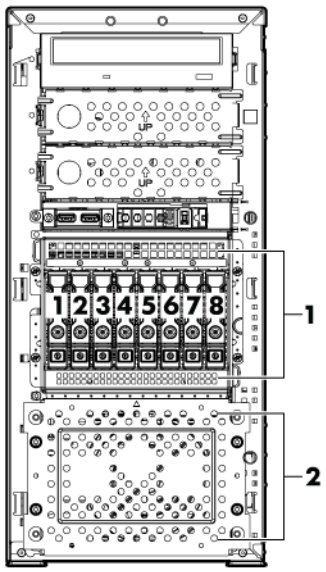
Item	Description
1	Cache module
2	Capacitor pack cable connector
3	Internal SAS connector

SAS and SATA device numbers

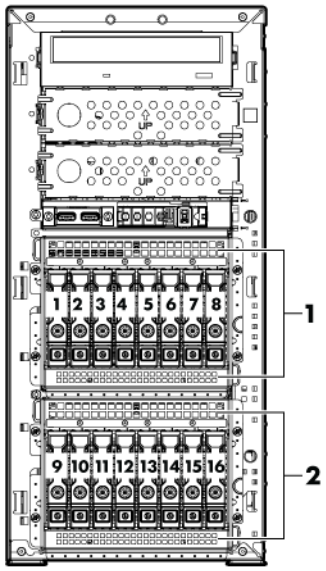
With optional drive cages installed, the server supports up to 16 SFF drives or up to 8 LFF drives. The server does not support mixing SFF and LFF drives.

HP recommends that you populate drive bays starting with the lowest SAS or SATA device number. Drives are numbered from left to right in each component box. Component boxes are numbered 1 to 2 from top to bottom.

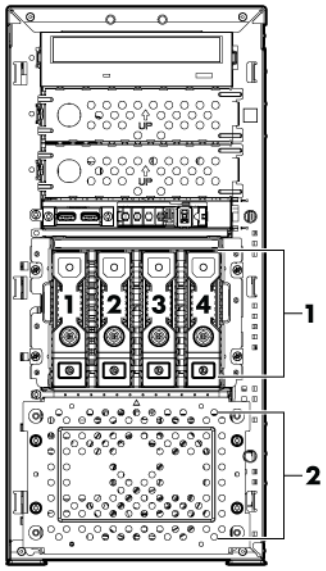
- SFF drive numbering



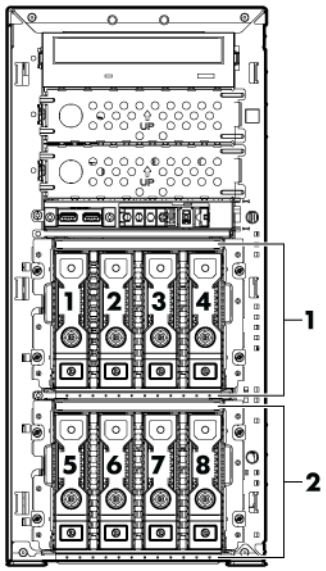
- Eight-bay + eight-bay SFF drive numbering



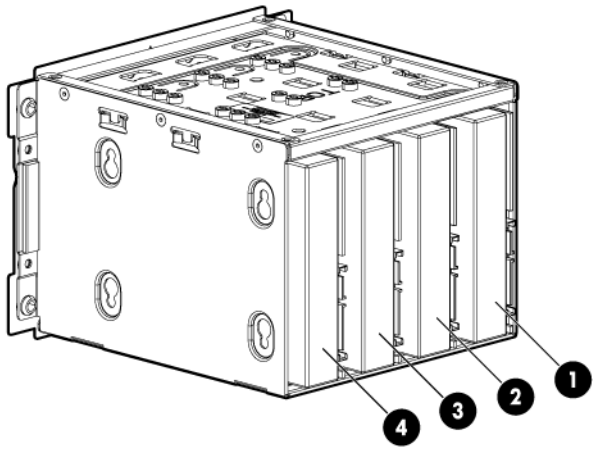
- LFF drive numbering



- Four-bay + four-bay LFF drive numbering (hot-plug only)



- Non-hot-plug drive numbering



SAS and SATA drive LED combinations

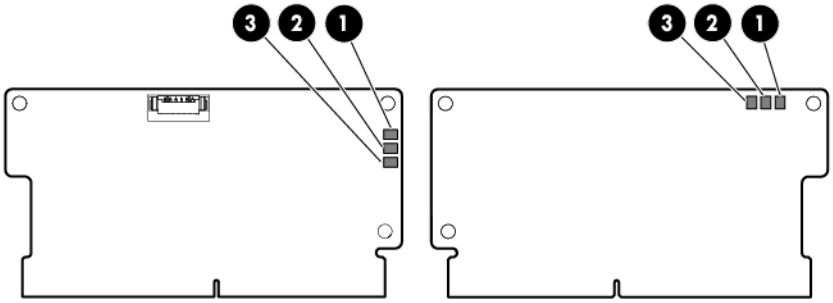
Online/activity LED (green)	Fault/UID LED (amber/blue)	Interpretation
On, off, or flashing	Alternating amber and blue	The drive has failed, or a predictive failure alert has been received for this drive. The drive also has been selected by a management application.
On, off, or flashing	Steadily blue	The drive is operating normally, and it has been selected by a management application.
On	Amber, flashing regularly (1 Hz)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
On	Off	The drive is online, but it is not active currently.
Flashing regularly (1 Hz)	Amber, flashing regularly (1 Hz)	The drive is part of an array that is undergoing capacity expansion or stripe migration, but a predictive failure alert has been received for this drive. To minimize the risk of data loss, do not replace the drive until the expansion or migration is complete.*
Flashing regularly (1 Hz)	Off	The drive is rebuilding, or it is part of an array that is undergoing capacity expansion or stripe migration.*
Flashing irregularly	Amber, flashing regularly (1 Hz)	The drive is active, but a predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Flashing irregularly	Off	The drive is active, and it is operating normally.
Off	Steadily amber	A critical fault condition has been identified for this drive, and the controller has placed it offline. Replace the drive as soon as possible.
Off	Amber, flashing regularly (1 Hz)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Off	Off	The drive is offline, a spare, or not configured as part of an array.

* Do not remove the drive. Removing a drive might terminate the current operation and cause data loss.

FBWC module LED definitions

P222 and P430 modules

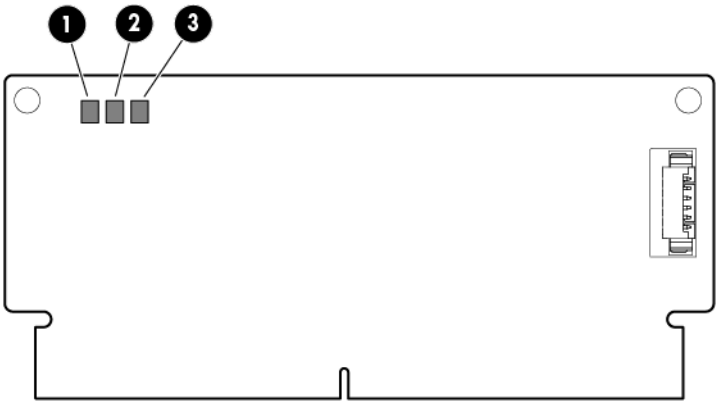
The FBWC module has three LEDs (one amber and two green). The LEDs are duplicated on the reverse side of the FBWC module to facilitate status viewing.



1 - Amber	2 - Green	3 - Green	Interpretation
Off	Off	Off	The FBWC module is not powered.
Off	Flashing 0.5 Hz	Flashing 0.5 Hz	The FBWC microcontroller is executing from within its boot loader and receiving new flash code from the host controller.
Off	Flashing 1 Hz	Flashing 1 Hz	The FBWC module is powering up, and the capacitor pack is charging.
Off	Off	Flashing 1 Hz	The FBWC module is idle, and the capacitor pack is charging.
Off	Off	On	The FBWC module is idle, and the capacitor pack is charged.
Off	On	On	The FBWC module is idle, the capacitor pack is charged, and the cache contains data that has not yet been written to the drives.
Off	Flashing 1 Hz	Off	A backup is in progress.
Off	On	Off	The current backup is complete with no errors.
Flashing 1 Hz	Flashing 1 Hz	Off	The current backup failed, and data has been lost.
Flashing 1 Hz	Flashing 1 Hz	On	A power error occurred during the previous or current boot. Data might be corrupt.
Flashing 1 Hz	On	Off	An overtemperature condition exists.
Flashing 2 Hz	Flashing 2 Hz	Off	The capacitor pack is not attached.
Flashing 2 Hz	Flashing 2 Hz	On	The capacitor has been charging for 10 minutes, but has not reached sufficient charge to perform a full backup.
On	On	Off	The current backup is complete, but power fluctuations occurred during the backup.
On	On	On	The cache module microcontroller has failed.

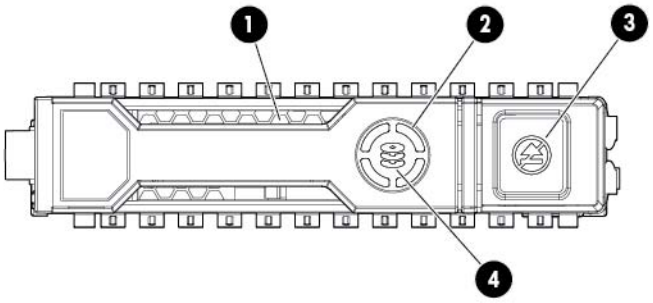
B120i module

The FBWC module has three LEDs (one amber and two green).



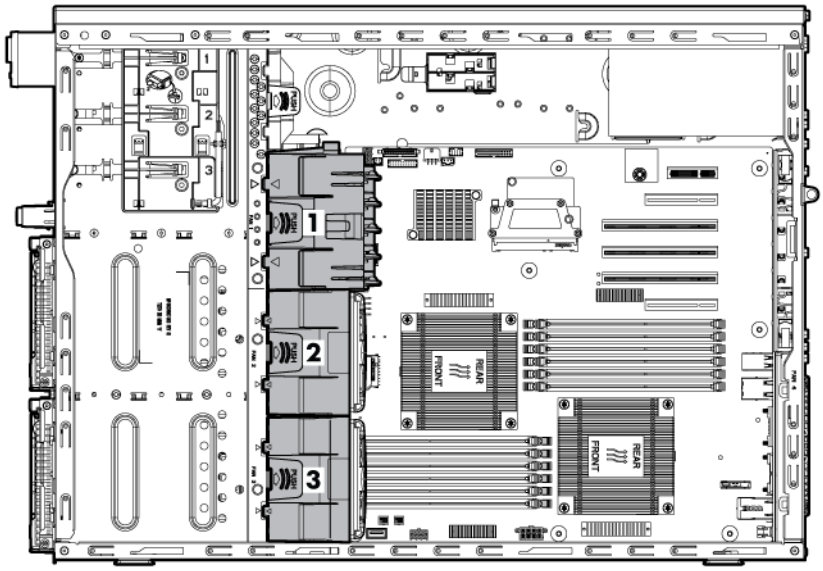
1 - Amber	2 - Green	3 - Green	Interpretation
Off	Off	Off	The FBWC module is not powered.
Off	Flashing 0.5 Hz	Flashing 0.5 Hz	The FBWC microcontroller is executing from within its boot loader and receiving new flash code from the host controller.
Off	Flashing 1 Hz	Flashing 1 Hz	The FBWC module is powering up, and the capacitor pack is charging.
Off	Off	Flashing 1 Hz	The FBWC module is idle, and the capacitor pack is charging.
Off	Off	On	The FBWC module is idle, and the capacitor pack is charged.
Off	On	On	The FBWC module is idle, the capacitor pack is charged, and the cache contains data that has not yet been written to the drives.
Off	Flashing 1 Hz	Off	A backup is in progress.
Off	On	Off	The current backup is complete with no errors.
Flashing 1 Hz	Flashing 1 Hz	Off	The current backup failed, and data has been lost.
Flashing 1 Hz	Flashing 1 Hz	On	A power error occurred during the previous or current boot. Data might be corrupt.
Flashing 1 Hz	On	Off	An overtemperature condition exists.
Flashing 2 Hz	Flashing 2 Hz	Off	The capacitor pack is not attached.
Flashing 2 Hz	Flashing 2 Hz	On	The capacitor has been charging for 10 minutes, but has not reached sufficient charge to perform a full backup.
On	On	Off	The current backup is complete, but power fluctuations occurred during the backup.
On	On	On	The FBWC module microcontroller has failed.

Hot-plug drive LED definitions



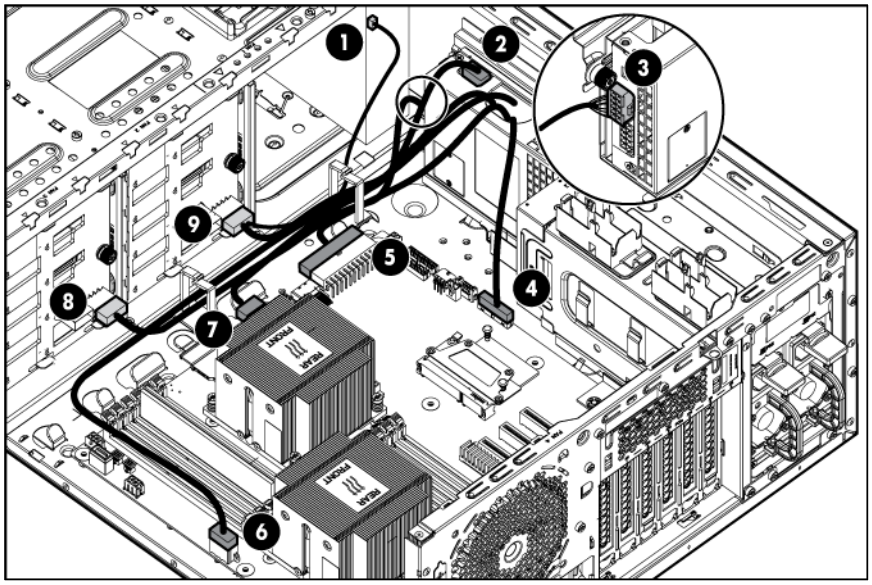
Item	LED	Status	Definition
1	Locate	Solid blue	The drive is being identified by a host application.
		Flashing blue	The drive carrier firmware is being updated or requires an update.
2	Activity ring	Rotating green	Drive activity
		Off	No drive activity
3	Do not remove	Solid white	Do not remove the drive. Removing the drive causes one or more of the logical drives to fail.
		Off	Removing the drive does not cause a logical drive to fail.
4	Drive status	Solid green	The drive is a member of one or more logical drives.
		Flashing green	The drive is rebuilding or performing a RAID migration, strip size migration, capacity expansion, or logical drive extension, or is erasing.
		Flashing amber/green	The drive is a member of one or more logical drives and predicts the drive will fail.
		Flashing amber	The drive is not configured and predicts the drive will fail.
		Solid amber	The drive has failed.
		Off	The drive is not configured by a RAID controller.

Fan locations



Item	Description	Configuration
1	Fan 1	Primary
2	Fan 2	Primary
3	Fan 3	Optional

Redundant power supply connectors



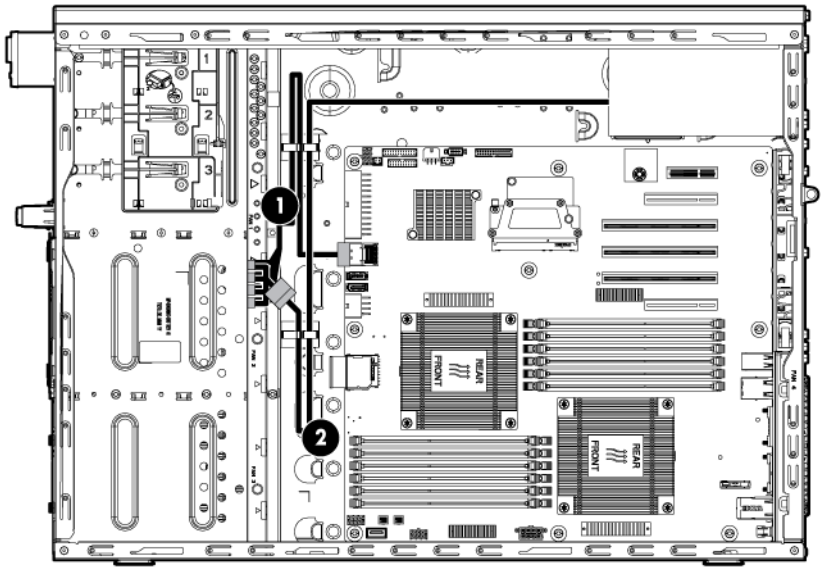
Item	Description	Connector identifier
1	Optical drive power connector	P7, P8, P9, P10
2	Processor 2 RPS backplane connector	P3
3	Box 2 RPS backplane connector	P5

Item	Description	Connector identifier
4	RPS connector	N/A
5	System board power connector	P1
6	Processor 2 power connector	P3M
7	Processor 1 power connector	P2
8	Box 2 power connector	P5H
9	Box 1 power connector	BP1

Cabling

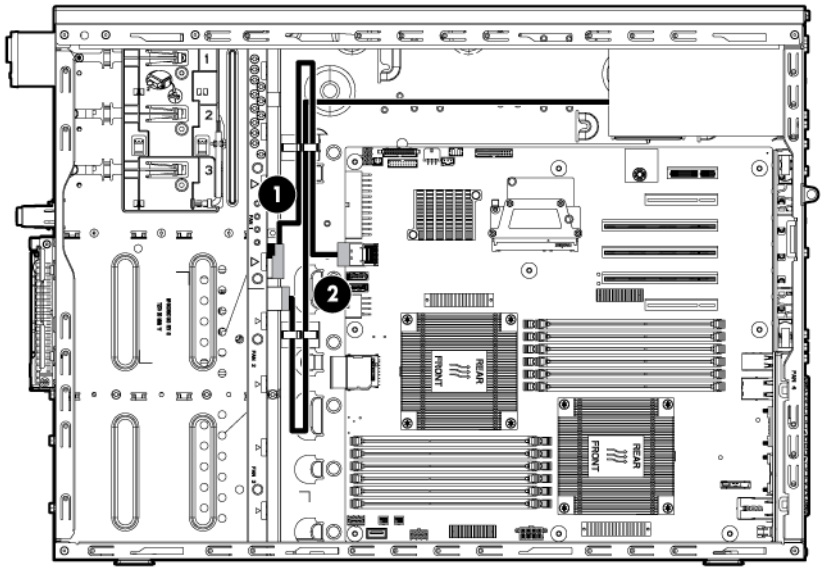
Storage cabling

Non-hot-plug, four-bay LFF drive cabling



Item	Description
1	Mini-SAS cable to system board
2	Box 1 power cable

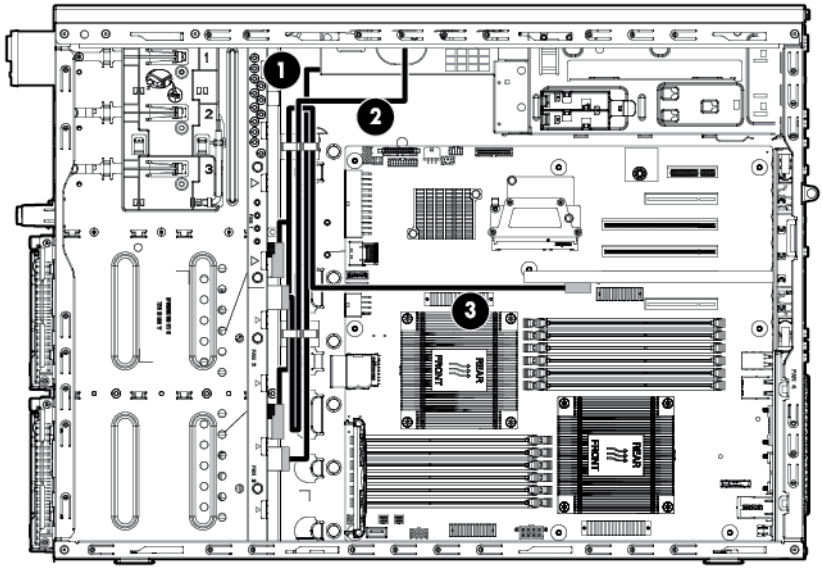
Hot-plug, four-bay LFF drive cabling



Item	Description
1	Mini-SAS cable to system board
2	Box 1 power cable

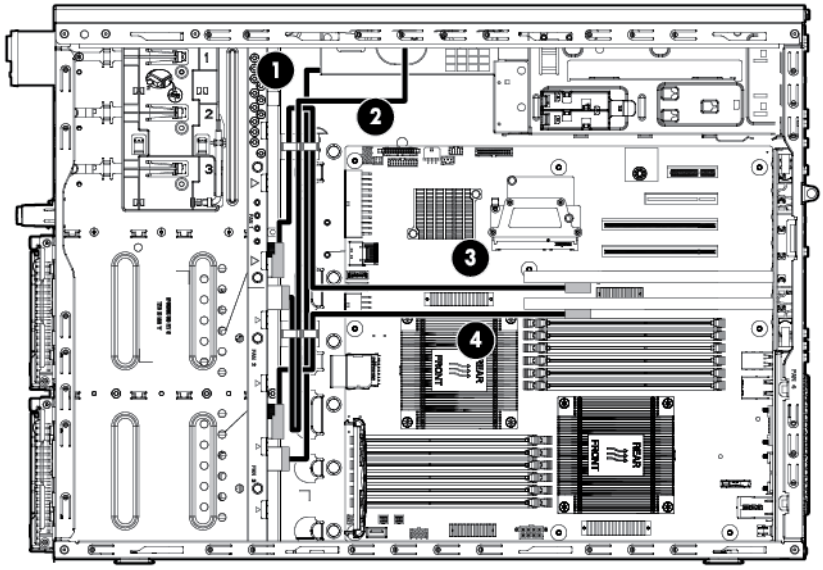
Hot-plug, four-bay + four-bay LFF drive cabling

- Four-bay + four-bay LFF drive cabling with P430 controller card



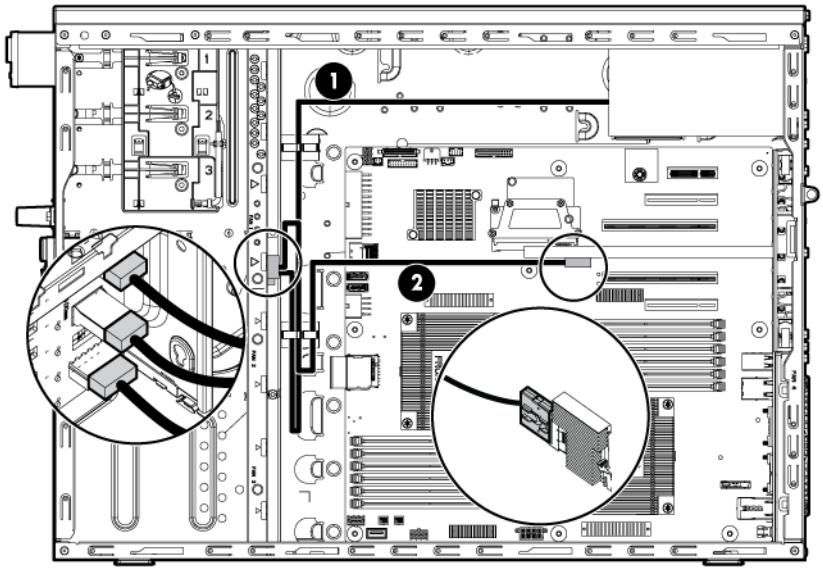
Item	Description
1	Box 2 power cable
2	Box 1 power cable
3	Mini-SAS Y cable to storage controller

- Four-bay + four-bay LFF drive cabling with two P222 controller cards



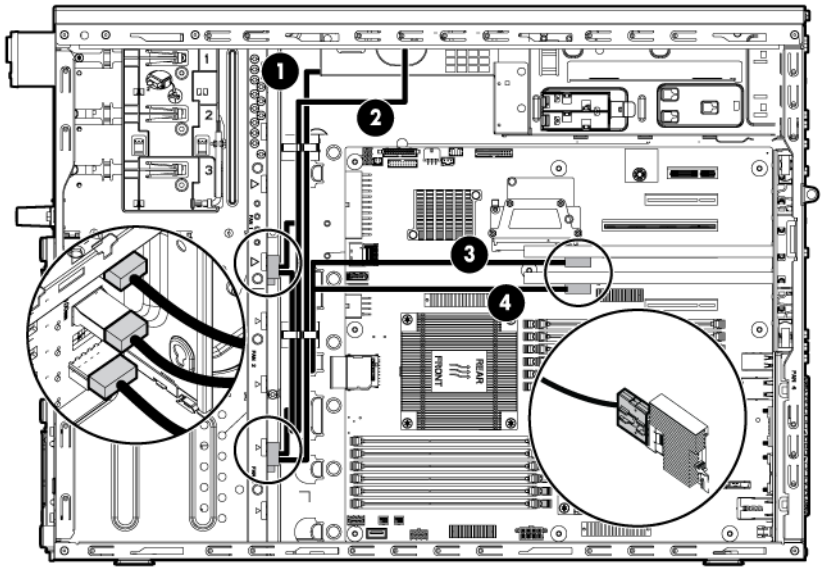
Item	Description
1	Box 2 power cable
2	Box 1 power cable
3	Box 1 Mini-SAS cable to storage controller
4	Box 2 Mini-SAS cable to storage controller

Hot-plug, eight-bay SFF drive cabling



Item	Description
1	Power cable
2	Mini-SAS Y-cable to storage controller

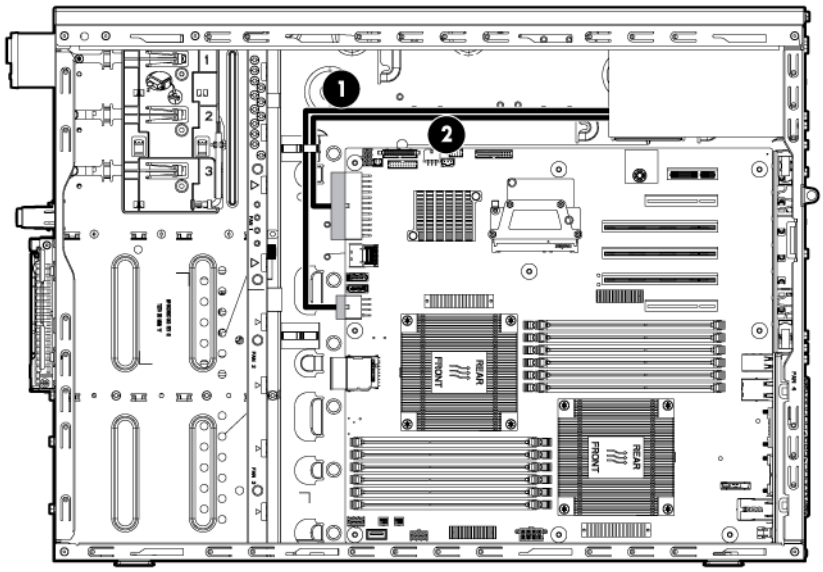
Hot-plug, eight-bay + eight-bay SFF drive cabling



Item	Description
1	Box 2 power cable
2	Box 1 power cable
3	Mini-SAS Y-cable to storage controller
4	Mini-SAS Y-cable to storage controller

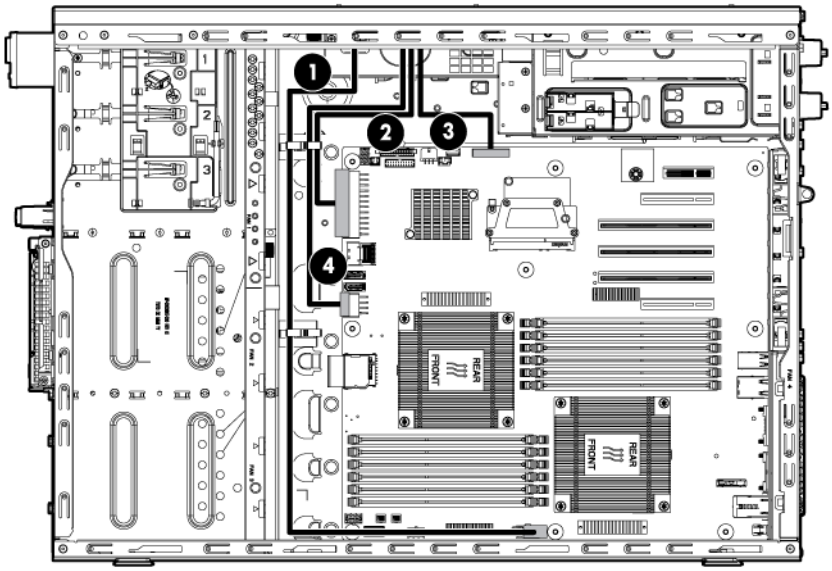
Power cabling

Integrated power cabling



Item	Description	Connector identifier
1	Processor 1 power cable	P1
2	System board power cable	P3

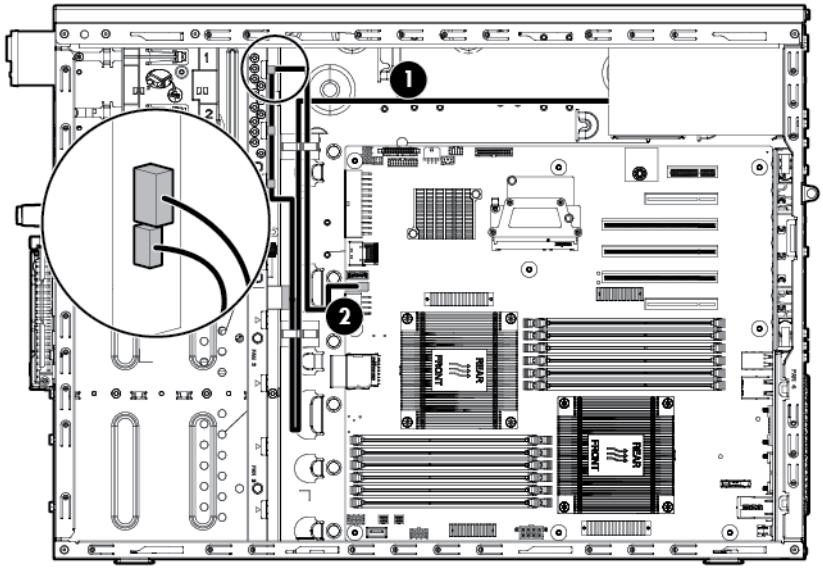
RPS power cabling



Item	Description	Connector identifier
1	Processor 2 power cable	P3M
2	System board power cable	P1

Item	Description	Connector identifier
3	RPS cable	N/A
4	Processor 1 power cable	P2

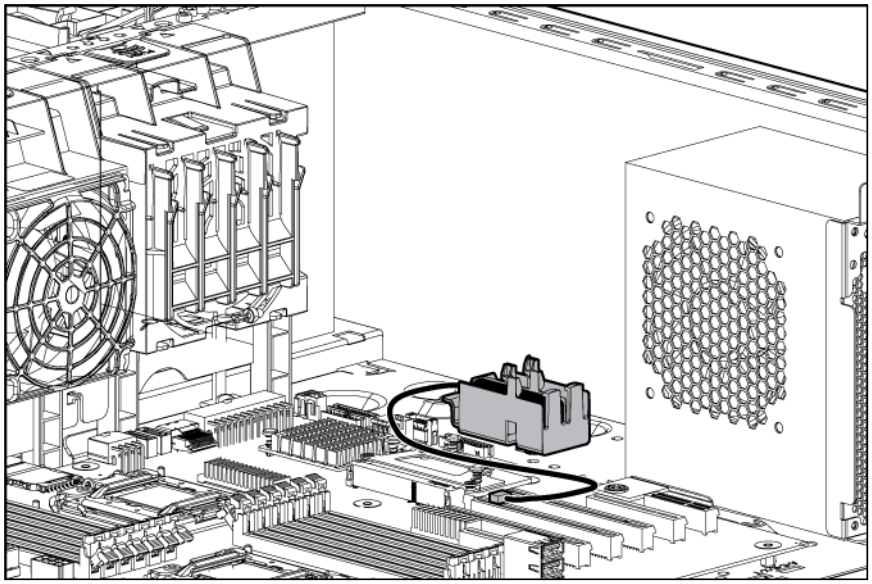
Optical drive cabling



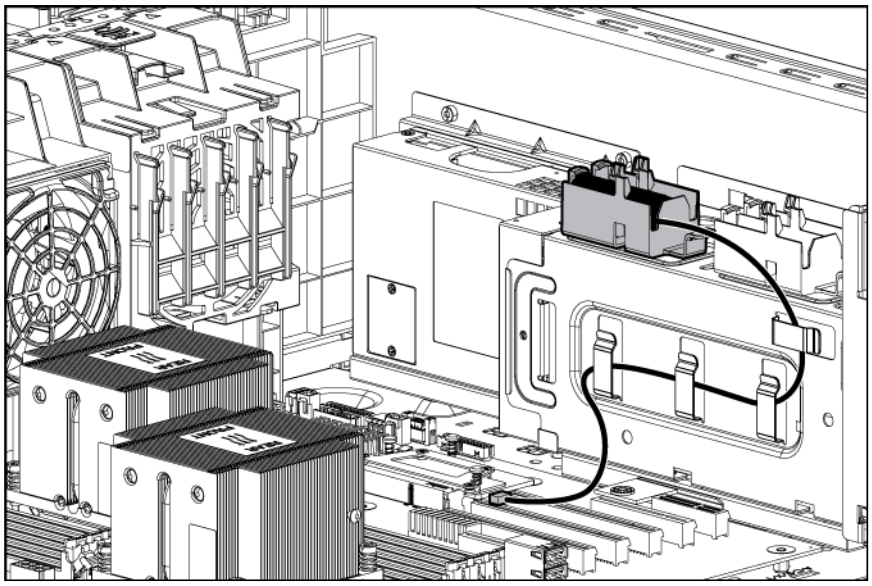
Item	Description	Connector identifier
1	Power cable	P7, P8, P9, P10
2	SATA cable	N/A

Capacitor pack cabling

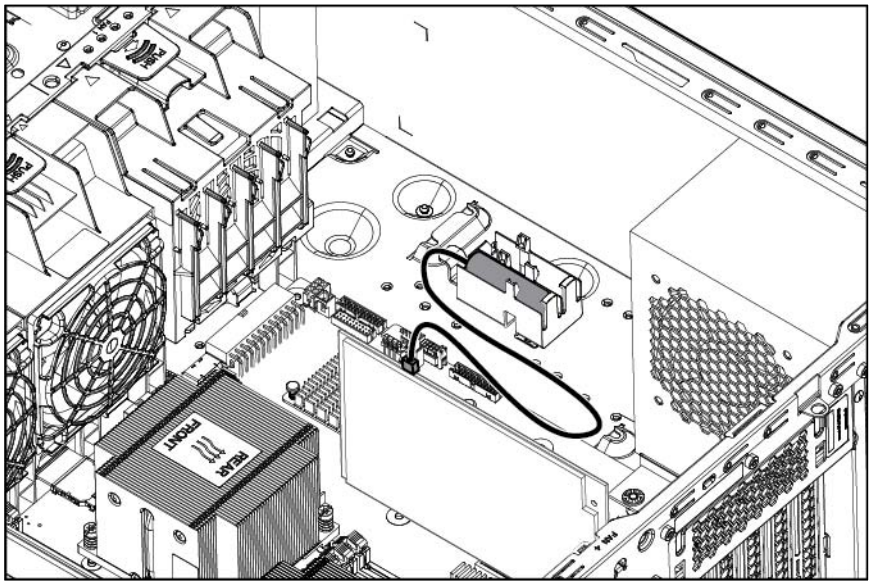
- Integrated configuration



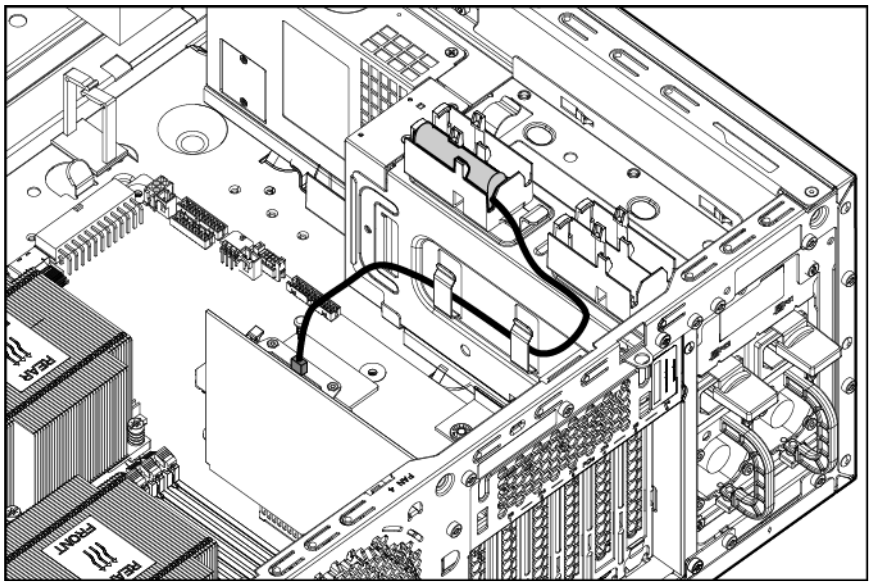
- RPS configuration



- Integrated configuration showing Smart Array controller card installed



- RPS configuration showing Smart Array controller card installed



Specifications

Environmental specifications

Specification	Value
Temperature range*	
Operating	10°C to 35°C (50°F to 95°F)
Nonoperating	-30°C to 60°C (-22°F to 140°F)
Relative humidity (noncondensing)	
Operating, maximum wet bulb temperature of 28°C (82.4°F)	10% to 90%
Nonoperating, maximum wet bulb temperature of 38.7°C (101.7°F)	5% to 95%

* All temperature ratings shown are for sea level. An altitude derating of 1°C per 304.8 m (1.8°F per 1,000 ft) to 3048 m (10,000 ft) is applicable. No direct sunlight allowed.

Server specifications

Specification	Value
Dimensions (with feet/bezel)	—
Height	43 cm (16.93 in)
Depth	63 cm (24.80 in)
Width	20 cm (7.87 in)
Weight (approximate)	—
Maximum (all hard drives, power supplies, and processors installed)	27 kg (59.53 lbs)
Minimum (one hard drive, power supply, and processor installed)	20 kg (44.09 lbs)

Power supply specifications

Depending on installed options, the server is configured with one of the following power supplies:

- HP ProLiant 460 W non-hot-plug power supply

Specification	Value
Input requirements	
Rated input voltage	100 to 240 V AC
Rated input frequency	50 Hz to 60 Hz
Rated input current	6 A to 3 A

Rated input power	590 W at 115 V AC input 570 W at 230 V AC input
BTUs per hour	2044 at 100 V AC input 2013 at 115 V AC input 2004 at 200 V AC input 1941 at 230 V AC input
Power supply output	
Rated steady-state power	460 W at 100 V to 120 V AC input 460 W at 200 V to 240 V AC input
Maximum peak power	460 W at 100 V to 120 V AC input 460 W at 200 V to 240 V AC input

- HP ProLiant 460 W CS power supply (94% efficiency)

Specification	Value
Input requirements	—
Rated input voltage	100 to 240 VAC
Rated input frequency	47 Hz to 63 Hz
Rated input current	8 A
Rated input power	509 W at 115V AC input 495 W at 230V AC input
Btus per hour	1764 at 100V AC input 1736 at 115V AC input 1694 at 200V AC input 1687 at 230V AC input
Power supply output	—
Rated steady-state power	460 W at 100V to 120V AC input 460 W at 200V to 240V AC input
Maximum peak power	460 W at 100V to 120V AC input 460 W at 200V to 240V AC input

- HP ProLiant 750 W CS hot-plug power supply (94% efficiency)

Specification	Value
Input requirements	—
Rated input voltage	100 V AC–240 V AC
Rated input frequency	50 Hz–60 Hz
Rated input current	9 A–4.5 A
Maximum rated input power	831 W at 115 V AC input 808 W at 230 V AC input
Btus per hour	2878 at 100 V AC input 2834 at 115 V AC input 2769 at 200 V AC input 2758 at 230 V AC input
Power supply output	—
Rated steady-state power	750 W at 100 V to 120 V AC input

	750 W at 200 V to 240 V AC input
Maximum peak power	750 W at 100 V to 120 V AC input 750 W at 200 V to 240 V AC input

Hot-plug power supply calculations

For hot-plug power supply specifications and calculators to determine electrical and heat loading for the server, see the HP Power Advisor website (http://www.hp.com/go/hppoweradvisor).

Acronyms and abbreviations

ABEND

abnormal end

AMP

Advanced Memory Protection

ASR

Automatic Server Recovery

CSR

Customer Self Repair

DDR

double data rate

FBWC

flash-backed write cache

HP SIM

HP Systems Insight Manager

iLO

Integrated Lights-Out

IML

Integrated Management Log

LFF

large form factor

NMI

nonmaskable interrupt

NVRAM

nonvolatile memory

PCIe

Peripheral Component Interconnect Express

POST

Power-On Self Test

RBSU

ROM-Based Setup Utility

RPS

redundant power supply

SAS

serial attached SCSI

SATA

serial ATA

SD

Secure Digital

SFF

small form factor

SPP

Standard Parallel Port Mode

TPM

Trusted Platform Module

UID

unit identification

USB

universal serial bus

Documentation feedback

HP is committed to providing documentation that meets your needs. To help us improve the documentation, send any errors, suggestions, or comments to Documentation Feedback (mailto:docsfeedback@hp.com). Include the document title and part number, version number, or the URL when submitting your feedback.

Index

A

access panel 26
air baffle 28
Automatic Server Recovery (ASR) 61

B

battery 57
buttons 23, 62

C

cabling 78
cache module 38
capacitor pack 39
capacitor pack cabling 83, 84
cautions 24
components 15, 62, 69
components, front panel 62
components, identification 15, 62
components, rear panel 65
components, system board 66
connectors 62
controller options 69
crash dump analysis 68
customer self repair (CSR) 5

D

device numbers 70
diagnosing problems 59
diagnostic tools 60, 61
diagnostics utility 60
DIMM slot locations 69
DIMMs, removing 43
documentation feedback 91
drive blank 32
drive cabling 78, 79, 80, 81
drive carrier 32
drive LEDs 75
drive numbering 70
drives 33, 75
drives, removing 33, 34

E

electrostatic discharge 23
environmental requirements 86
environmental specifications 86
error messages 59
expansion boards 41

F

fan modules 31
fans, removing 31
FBWC cabling 78, 83, 84
FBWC capacitor pack 39
FBWC module LEDs 73
features 62
firmware upgrade utility, troubleshooting 59
front panel buttons 64
front panel components 62
front panel LED/buttons module 30
front panel LEDs 64
front USB module 29

H

hard drive LEDs 75
hard drives, determining status of 75
health driver 61
health LED 64
heatsink 44
hot-plug drive, removing 33
HP Insight Diagnostics 60
HP Insight Diagnostics survey functionality 60
HP Service Pack for ProLiant 60
HP technical support 5

I

identifying components 62
illustrated parts catalog 15
iLO (Integrated Lights-Out) 61
IML (Integrated Management Log) 61
Insight Diagnostics 60
Integrated Lights-Out (iLO) 61
Integrated Management Log (IML) 61

Intelligent Provisioning 60
internal cables 78

L

LEDs, FBWC module 73, 74
LEDs, front panel 64, 75
LEDs, hard drive 72, 75
LEDs, rear panel 66

M

management tools 60
mechanical components 15
memory dump 68

N

NMI functionality 68

O

operating system crash 61, 68
operating systems supported 60
optical drive 37
optical drive cabling 83

P

PCI air baffle 27
POST error messages 59
power cabling 82
power calculator 88
power supplies 35
power supplies, removing 36
power supply cabling 82
power supply specifications 86
powering down 25
powering up 25
preparation procedures 24
problem diagnosis 59
processors 46

R

RBSU (ROM-Based Setup Utility) 60
rear panel buttons 66
rear panel components 65
rear panel LEDs 66
redundant power supply cable connector 76
removal and replacement procedures 23
required tools 23
ROM-Based Setup Utility (RBSU) 60

S

safety considerations 23
safety information 23
SAS drive numbers 70
server specifications 86
server warnings and cautions 24
specifications 86, 88
specifications, environmental 86
specifications, server 86
static electricity 23
symbols on equipment 23
system air baffle 28
system battery 57
system board components 18, 66
system board LEDs 68
system board replacement 50
system components 62
system maintenance switch 67
system power LED 68

T

technical support 5
temperature requirements 86
tower bezel, removing 26
TPM (Trusted Platform Module) 58
troubleshooting 59
troubleshooting resources 59
troubleshooting, firmware upgrade utility 59
Trusted Platform Module (TPM) 58

U

USB support 61
utilities 60

W

warnings 24